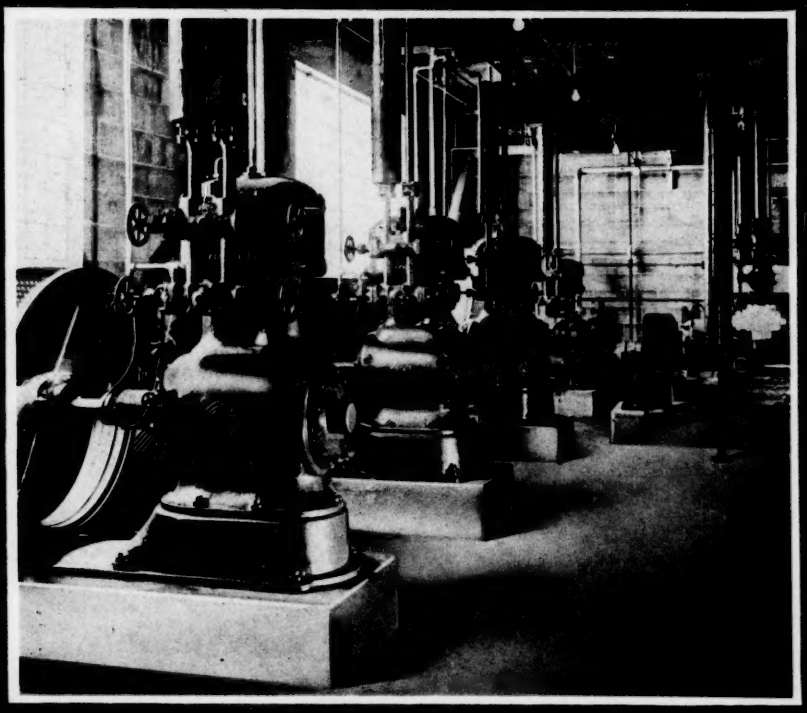
ICE and REFRIGERATION

THE
INDUSTR



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OCTOBER • 1951

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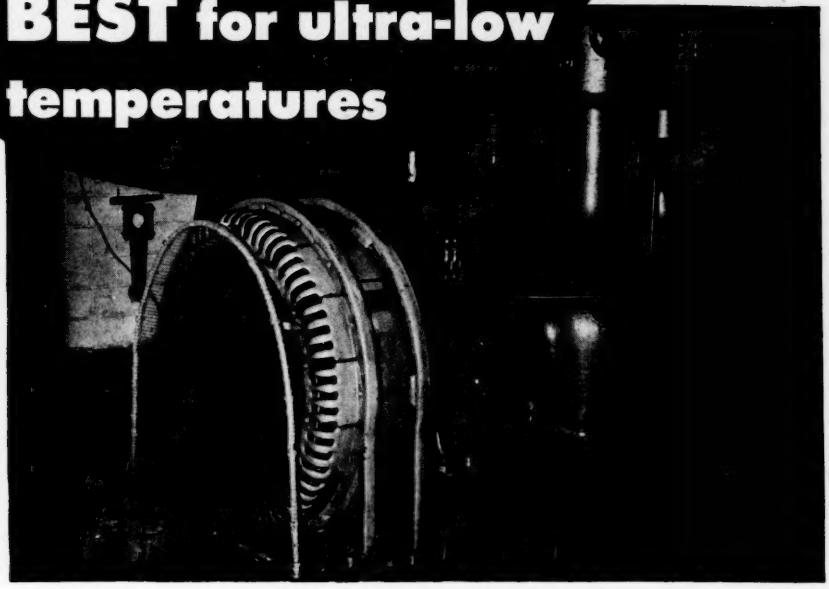
BETTER for regular use
BEST for ultra-low temperatures



. . . the New and Improved TEXACO CAPELLA OIL (WAXFREE)

WHEN you lubricate refrigerating compressors with the new and improved *Texaco Capella Oil (Waxfree)*, efficiency goes up; maintenance costs come down. It's ideal for regular use—and *no other oil equals it for ultra-low temperature service!* Even at minus 100° F., *Texaco Capella Oil (Waxfree)* assures freedom from wax precipitation.

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There is a complete line of *Texaco Capella Oils (Waxfree)* to step up the efficiency of your compressors regardless of temperature or operating conditions. Available in especially sealed 55-gallon drums, and 5-gallon, 1-gallon and 1-quart cans for make-up.

A Texaco Lubrication Engineer will gladly help you select the proper *Texaco Capella Oil (Waxfree)* for your compressors. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

☆ ☆ ☆

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TEXACO

TEXACO Capella Oils (Waxfree)

FOR ALL REFRIGERATING AND AIR CONDITIONING EQUIPMENT

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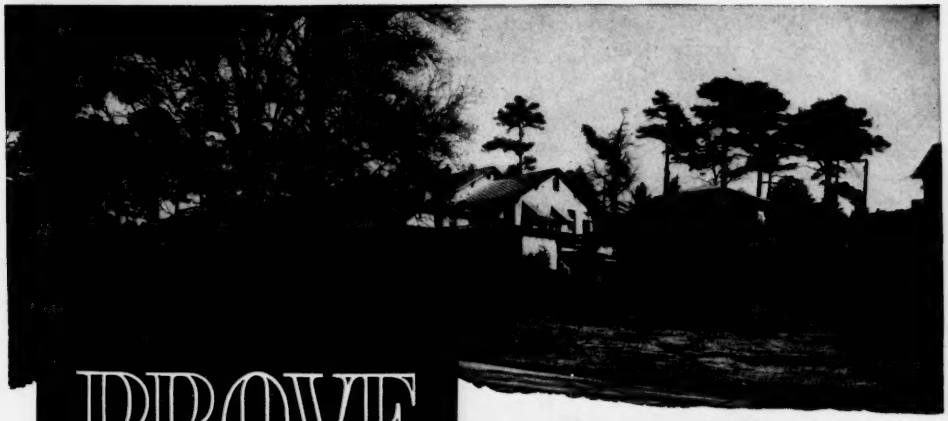
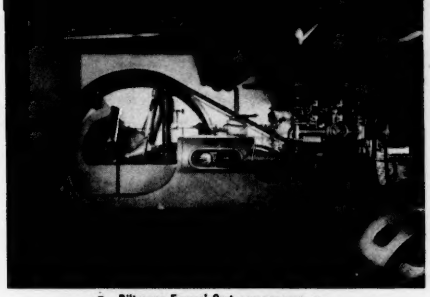


PROVE

the Superior Performance of CP Refrigeration

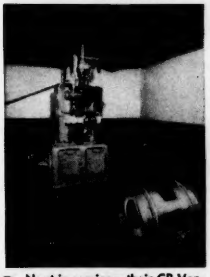


1 Biltmore Farms' first compressor, a CP 8 x 18 Horizontal—still on the job.

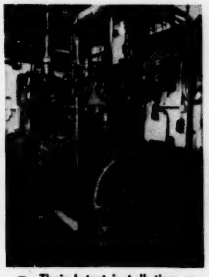
In the renowned Biltmore Dairy Farms, at Asheville, N. C., three "generations" of CP Ammonia Compressors have been installed and are still in use. The horizontal machine ("grandaddy" of them all), has operated for 25 years. Today's output is normally handled by a CP 8 x 8 two-cylinder Vertical, supplemented by a CP Type-K 6¾ x 5 Multi-Cylinder Booster.

CP is proud that Biltmore Dairy Farms, one of the nation's outstanding producer dairies, has repeatedly chosen CP refrigeration equipment on the basis of its consistent performance record.

You can depend on CP equipment, too.



2 Next in service—their CP Vertical Compressor (two-cylinder 8 x 8).



3 Their latest installation, a CP Type-K Booster.

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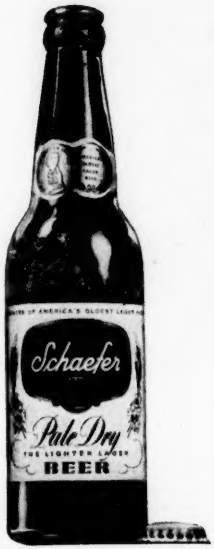


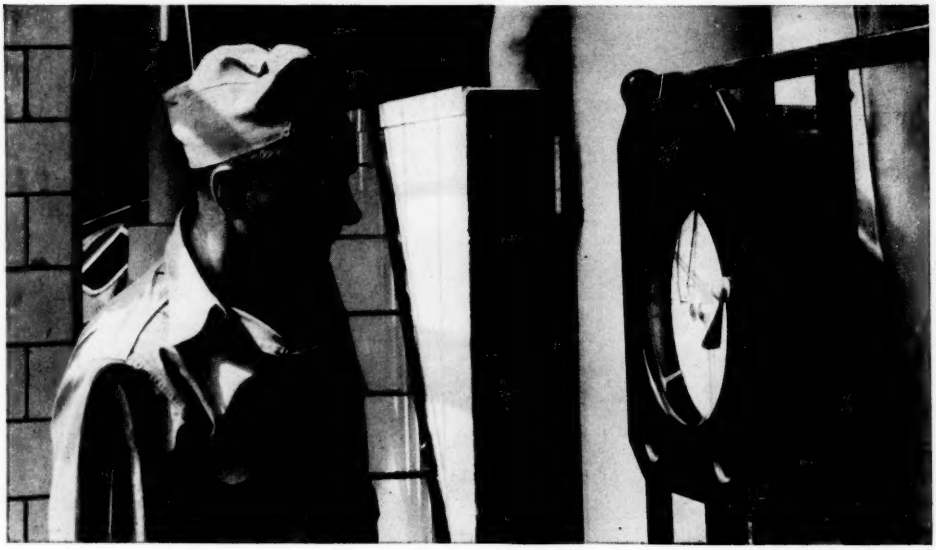
WHY has Schaefer Beer, sold only in the east, become one of the nation's best sellers? Largely because of close quality control in every step of their brewing process. The refrigeration system, shown below, is just one of the many places in the Schaefer plant where attention to details means Taylor control.

A FULSCOPE* Single Duty Pressure Recording Controller regulates the oil pressure of a turbine speed governor according to the back pressure of the ammonia section of a centrifugal compressor system which serves the processing and storage areas. Result: precisely controlled temperature, lower operating cost for the F & M Schaefer Brewing Company.

For complete information on Taylor's full line of accurate, dependable instruments for the refrigerating industry, ask your Taylor Field Engineer or write for Catalog 300. Taylor Instrument Companies, Rochester, N. Y., or Toronto, Canada. *Instruments for indicating, recording and controlling temperature, pressure, flow, liquid level, speed, density, load and humidity.*

Taylor's Centennial
ACCURACY FIRST
SINCE 1851

*Reg. Trade-Mark



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ICE and Refrigeration

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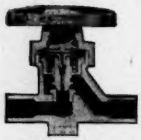

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With balanced-action

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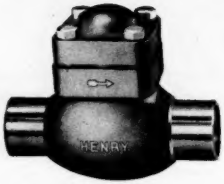
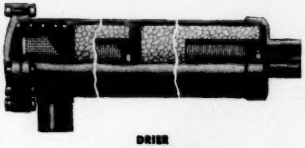
Valves are backseating—diaphragms may be inspected or replaced without loss of liquid. Conforms with all safety code requirements.



CHECK VALVE
Piston Type For Freon. Sizes ⅜" through 4⅛" O.D.S.



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2 cubic inches more than established practice. Forged brass end caps.

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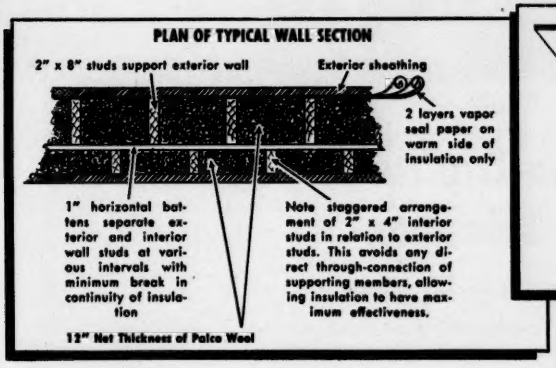
INSTALLATION FILE NO. 1017

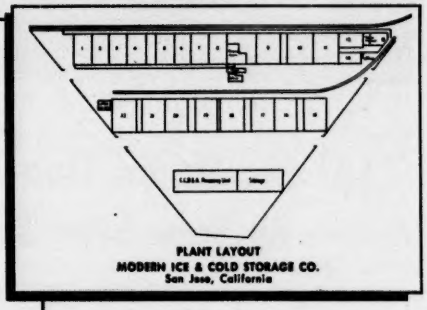
You can depend on *durability* of PALCO INSULATION WOOL

BIG CALIFORNIA PLANT FINDS 10-YEAR-OLD PALCO WOOL "GOOD AS NEW"

Built in 1941, the big Modern Ice & Cold Storage Co. plant at San Jose, Calif., was completely insulated with Palco Wool. During recent remodeling, some of the Palco Wool was removed and found to be in perfect condition for re-use, according to William Giacomazzi, Jr., Plant Manager. Resilience and flame-proof quality was unimpaired. This is typical of virtually indestructible Palco Wool, which retains its low thermal conductivity of only .255 Btu indefinitely. Non-settling; resistant to moisture, vermin and decay; odorless and odor proof, Palco Wool is the finest low temperature insulation available.

Above: Modern Ice & Cold Storage Co. originally insulated throughout with 8" thickness of Palco Wool. 12" thickness was used in recent addition, for use as freezer unit. Main function of plant is for pre-cooling Central California produce. Storage space totals 1,750,000 cu. ft. Plant was designed and equipped by Kahlenberger Engineering Corp.


PLAN OF TYPICAL WALL SECTION
2" x 8" studs support exterior wall
Exterior sheathing
2 layers vapor seal paper on warm side of insulation only
1" horizontal battens separate exterior and interior wall studs at various intervals with minimum break in continuity of insulation
Note staggered arrangement of 2" x 4" interior studs in relation to exterior studs. This avoids any direct through-connection of supporting members, allowing insulation to have maximum effectiveness.
12" Net Thickness of Palco Wool



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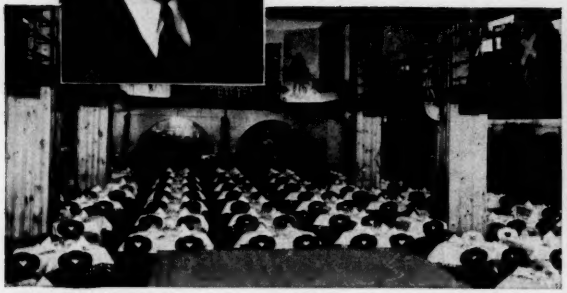
reports Herman Pirchner of Cleveland's Alpine Village



Alpine Village, in Playhouse Square, is Cleveland's only theatre restaurant. For 15 years it has been known as the smart spot for fine food before and after the theatre.

Let the Union One-Trip Ice Bag Be Your Star Salesman

LIKE HUNDREDS of other leading restaurants, Herman Pirchner's famous Alpine Village buys processed ice from a company using Union Paper Ice Bags.

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because they are engineered for modern refrigeration equipment

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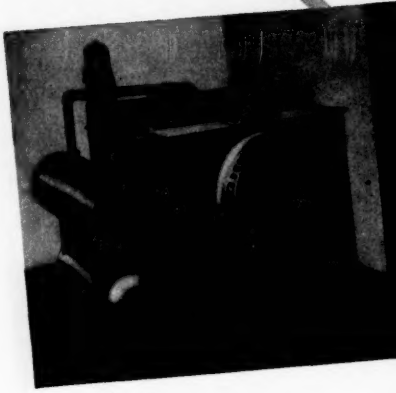
Illustration shows two views of a 35 ton Condenser Tower prior to partial disassembly for shipment.



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FOR CONDENSING REFRIGERANTS

SINGLE RESPONSIBILITY:

Vogt, leading builder of refrigeration condensers, assumes responsibility for engineering the unit. Only one purchase order needed.

SHOP FITTED:

To cut down field assembly labor. Requires no cutting or fitting of pipe.

Designed for today's water conservation requirements, and to keep refrigeration costs low, the *new* Vogt Condenser Tower meets the need for a proven, readily cleanable condensing unit.

The Vogt Condenser Tower consists of a multipass straight tube condenser, a receiver, an oil trap, a cooling tower, and a water pump. Removable cast iron heads permit easy cleaning of the condenser tubes.

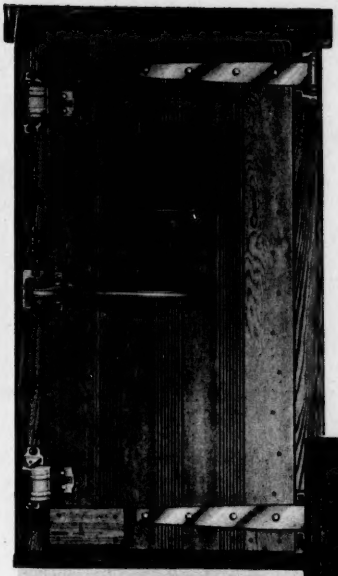
Water costs are extremely low since the cooling water is recirculated continuously and requires only a small amount of makeup to replace losses due to windage and evaporation.

Condenser Tower units are available in capacities ranging from 5 to 50 tons refrigeration. Additional information will be furnished upon request.

HENRY VOGT MACHINE CO., Louisville 10, Kentucky

BRANCH OFFICES: NEW YORK, PHILADELPHIA, CLEVELAND, CHICAGO, ST. LOUIS, DALLAS, CHARLESTON, W. VA.

THIS IS A Butcher Boy COLD STORAGE DOOR



LEADER IN APPEARANCE AND CONSTRUCTION

Butcher Boy offers the ONLY cold storage door which will maintain a 100% tight seal and insure ease of opening and closing at all times. Butcher Boy equipment is built of the highest quality materials obtainable and constructed for greatest rigidity. Besides the doors and special features shown, Butcher Boy offers a complete service on special refrigerator windows and fronts. We will be pleased to give estimates on any cold storage problems. Send us your specifications. There is no obligation.

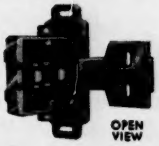
DISTINCTIVE Butcher Boy HARDWARE

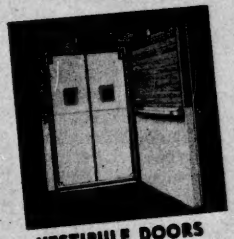
Super-Seal FASTENERS

Maintain a 100% tight seal between the door gaskets and frame, thereby preventing WARPING and DOOR ICING. They are durable, modern and easy to install.

FEATURES

Adjustable Tension • Bronze Bearing • Steel Rollers • Extra Heavy Casting • Heavy Galvanized • Adjustment Feature • 2 Steel Springs.





VESTIBULE DOORS

Butcher Boy Vestibule doors are used where long periods of opening prevail. Doors are kept in closed position by an automatic self-closing device which prevents refrigeration losses.

A BUTCHER BOY *Exclusive* FEATURE

LONG LIFE due to vertical bevels.

STRENGTH because of cross-grain construction.

APPEARANCE due to the streamlined nature of the "Floating Joint."

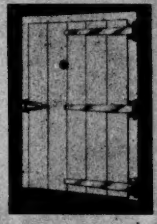
"FINGER TIP" DOOR OPENERS

Minimize the effort of opening heavy cold storage doors by application of the laws of leverage. Extra heavy, long, modernistic handles. Easily installed on any door.

TRACK DOOR OPERATOR

The Butcher Boy Track Door operator is simple and practical. Its operation is SMOOTH—POSITIVE—AUTOMATIC. Made of SOLID BRONZE. Completely gasketed to prevent leaks in "closed" position.

METAL-CLAD DOORS



Butcher Boy offers this type of door for fire protection purposes. Joints and seams are folded and locked, no solder and no nail heads exposed.

SUPER-FREEZER (OVERLAP) DOORS

A special type of cold storage door designed primarily for near-zero or sub-zero temperatures. It prevents doors from becoming icy and therefore hard to open.

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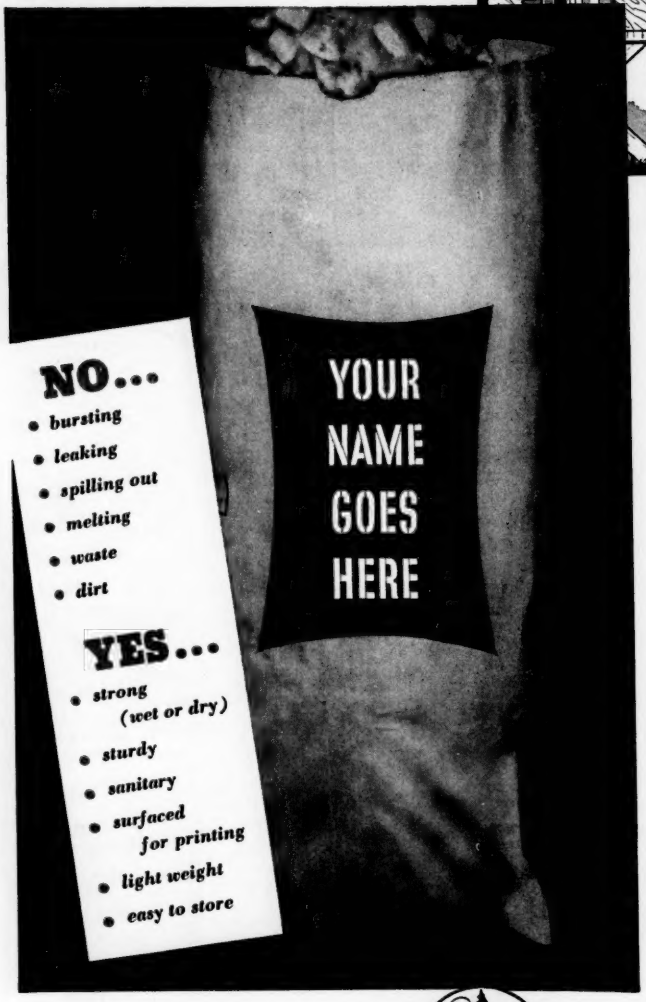
76% of your CUSTOMERS want ICE CUBES in this type BAG*



*

"ICE & REFRIGERATION" SURVEY PROVES CUSTOMERS PREFER WET STRENGTH ICE BAGS.

Of 3937 mechanical refrigerator owners asked, 2992 chose wet strength paper bags as the most practical ice cube package. Deliver your cubes in the best . . . International Hydrotuf.* They're easy to carry, neat to use, and they keep ice longer.

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KEEP YOUR PRODUCT AND SERVICE SOLD.

The bag you use for ice cubes is part and parcel of your service when signed with your name and advertising message. Make sure it's an International bag.

*Reg. Trade Mark

INTERNATIONAL PAPER COMPANY
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In The Spotlight

MORE PEOPLE continue to face more problems in the construction and operation of freezer rooms. From unusually broad experience in this field, Ed. L. Nelson recounts the difficulties and details the remedies when floors heave, doors wear out and headaches appear. See page 15.

PREVENTIVE ELECTRICAL Maintenance by Oliver J. Ruel tells how to set up an effective program to keep electrical equipment in operation at low cost. The various types of motors are covered along with controls, switches and circuit breakers. Wire and cable are also included in this direct informative treatment of the subject in article on page 19.

THE ANNUAL N.A.P.R.E. Convention will be held at Memphis, Tenn., November 6-9. The program has been arranged to offer up-to-date information in the field of refrigerating engineering. A preview of the event starts on page 26.

PROBLEMS in the ice business, new selling ideas and merchandising will be introduced and discussed at the annual convention of the National Association of Ice Industries to be held at the Shamrock Hotel, Houston, Texas, November 13 to 16. A brief review of the big event starts on page 33.

ICE FOR REFRIGERATING fresh fruits in storage is not particularly new to the San Joaquin Valley, California. For illustrated description of a plant designed and constructed for that purpose see page 35.

A NEW DAIRY plant has been opened at Niagara Falls, N. Y. with completely modern refrigerating equipment. For pictures and description see page 38.

COVER PICTURE: Refrigerating machines in engine room of the Wendt Dairy Company plant, Niagara Falls, N. Y. There are six of these refrigerating machines in the Wendt plant, including a booster for low temperature work. See page 38 for story.

WHAT'S WRONG with the warehousing business was the subject of an article by Harold C. Emerson in the August issue. It prompted a flood of letters from interested warehousemen and frozen food packers and many of these are printed with the article starting on page 41.

FISHERIES and the cold storage industry form a natural business alliance because each is dependent upon the other in the chain of food distribution. This subject is discussed on page 44 by a warehouseman who has had experience in handling fishery products.

THE INEQUITIES of the new tax bill now in Congress and certain measures to relieve these inequities are cited in a brief submitted to members of the Senate and House Committees by the National Association of Refrigerated Warehouses. Full text of the brief starts on page 46.

ICE CUBES AND CRUSHED ICE are very popular with the people of Kitchener, Ontario, Canada, supplied through vending machines by the Kitchener Tri-Pure Ice Company. The modernization and expansion of this plant is described in the article on page 37.

COLD STORAGE holdings for August 31 were up slightly over July 31 one point for coolers and three points for freezers. Details are included in the report published on page 54.

60 Years Ago

From the October, 1891 Issue of ICE AND REFRIGERATION

PEOPLE who have to endure summer weather in these modern days, says an editorial, don't know what a comparative luxury life nowadays is, as against the privations of the pioneer days in California. It is relatively easy to keep cool in these days with ice retailing at half a cent a pound . . . It was not so in the olden days when ice was brought to San Francisco in ships from Boston . . . In a pinch a dollar a pound was freely paid.

THE NEW Brown Hotel at Denver, Colo. awarded a contract to the Hercules Iron Works for installation of an ice-making and refrigerating machine of 20 tons capacity to be used for making pure crystal ice for use of the hotel and for furnishing cold storage. The specifications called for one of the finest ice plants ever erected for hotel purposes.

AN INVENTOR describes his idea, already patented, to place pipe coil coolers around city water mains and furnish cold water in summer to all homes and businesses. We still agree it would use refrigeration in volume but probably economic considerations intruded.

NUMEROUS ARTICLES on plants and operation appear, just as in present issues. Several writers discuss construction of cold rooms. White core or cloudiness in distilled water ice is analyzed.

COLD STORAGE of eggs is discussed by D. B. Beemer, an expert of that day and he compares the results obtained with ice and with mechanical refrigeration. The construction of refrigerator cars and patents in this field are described in another article.

ANNOUNCEMENT is made of a decision by the New York Court of Appeals fixing the liability of cold storage warehouses to maintain a temperature sufficient to preserve the goods, which implies a guarantee by the cold storage company against their loss through imperfect conditions of temperature and in case of such loss holds the warehouse liable for damage. The decision was made in a suit filed against Linde & Co., cold storage operators of New York for loss of dressed poultry which was spoiled.

...is one way to bigger profits

Expensive "muscle power" in an ice plant is a continuous drain on profits as well as a man's constitution. It needn't be. Because a G-W slat conveyor is a big labor saver... moves bagged and cake ice around the plant or to delivery platforms in less time and with fewer broken cakes. That adds up to lower over-head—more sales—bigger profits.

G-W conveyors are designed to carry block or processed ice in bags on straight, curved or right angle sections, from room to room or the outside platform. Unlimited flexibility assures an arrangement to fit perfectly your plant layout.

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When You Think of Materials Handling, Think of GIFFORD-WOOD

FROST HEAVING FREEZER FLOORS

The need for holding low temperatures for frozen foods on ground floor levels has created the problem of heaving and buckling of floors caused by frost. The remedies.

E. L. NELSON
Division Chief Engineer
Union Ice Company
Los Angeles, Calif.

THE problem of frost heaving of floors has been increased because of the growth of the frozen food industry and the need for holding lower temperatures in existing rooms. Many structures are being converted to freezer storages and new freezers are being constructed. In addition, frost heaving has become acute in California because ice tanks that have been in normal use for years have started to buckle up in the middle, a phenomenon which we suspect is caused by the falling ground water level throughout the state.

Among the fifty or seventy-five zero degree buildings and perhaps a hundred ice tanks in California, we have many frost heaving cases. For example, a fifty foot by seventy-two foot basement and two story concrete cooler building in San Jose was converted to zero degree storage without insulation being added to the four-inch cork-insulated floor. The interior heaved over a six-year period to a total of six inches. Columns raised as well as the floor, and thus elevated the first and second floors and the roof. Coils curved with the structure and hangers had to be cut and adjusted to relieve the pipe stress.

This result might be expected but ice tanks were doing likewise. For instance, a plant having two 1764-can tanks built side by side and operating at 6 F was constructed in 1925 with 5 inch cork insulation. In 1934 it started to give trouble and notwithstanding partial and increasing remedial measures rose 5½ inches over a fifteen-year period. Here, also, the centerline columns came up, a movement which distorted the steel roof trusses, and resulted in shearing an occasional truss rivet with a rifle shot report. In another instance one of two 504-can tanks, side by side with 5 inch cork insulation, operated normally for nineteen years, and then heaved 2 inches in the following year.

Early Remedial Methods

Since all the frost heaving problems were incurred in buildings already constructed, it was a question of doing something with existing structures rather than developing preventive design. Furthermore, all this frost heaving started slowly and insidiously, and therefore was given only passing thought because of ever present more pressing problems.

In earlier years bad experience with freezing rooms built on the ground prompted designers and builders to place such rooms on upper floors of buildings. The desire for rapid handling of frozen foods with mechanized equipment however has brought freezers back to first floor levels in many plants. The problems appeared again in numerous locations. In California a number of ice freezing tanks have also experienced the same trouble.

From a broad experience in this field Ed. L. Nelson recounts what happened and gives a detailed description of remedial measures developed and applied. This article has been extracted from his paper on freezer room construction problems in the 1951 N.A.P.R.E. Operating Data Book recently published.

In any event several remedies were tried. The 1764-can tanks were in high ground - water - level country; therefore it was reasoned that, if ground water could be caused to flow under the tank slabs, it would defrost the ground and keep the refrigeration wiped from under the concrete. Consequently, shallow wells were put down along the sides of the building and fed with water, and corresponding shallow wells were pumped with core pump from between the tanks. The heaving slowed lowered some, and then stopped; then it started to increase. The frost heaving causative conditions were apparently increasing and overcoming our remedial methods. In view of the initial well success the same method was tried on another job with the same final results.

In this early period various other schemes were tried and gave partial relief such as saturating the underlying ground with brine, placing limited pipes under slabs with electric ground heater cable or water circulation.

Effective Methods

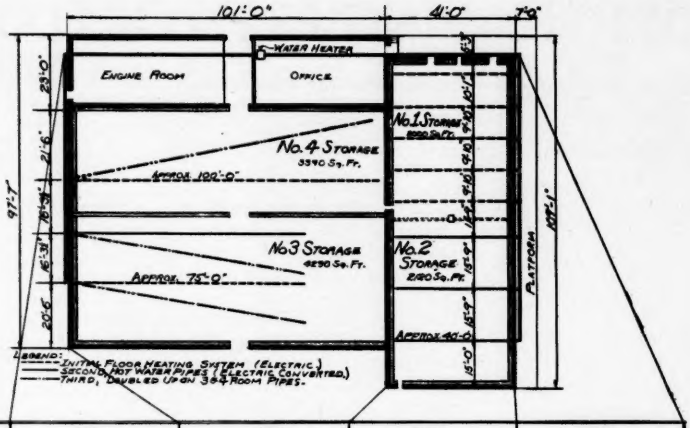
Confronted with the increasing numbers and the severity of frost heaving cases we drilled under the floor slabs; put in pipes on a basis we figured would be ample; installed electrical ground heater cable; and on later jobs introduced water, usually heated, through an inner pipe. On all new jobs the water pipes are put in during construction and are hooked to the heat source only if heaving develops. In just one case was the slab above ground level with sufficient side exposure, at least for the time being, to give cross ventilation, so that tile vent pipes could be used.

The classic of our floor heaving problems is known as "The Eleventh Avenue Story". It resulted in an engineering study and analysis of frost heaving causes and design factors for heating layouts for its cure. This study revolves about a dismantled ice plant on Eleventh Avenue in Los Angeles. It consisted of two tank rooms and two day store rooms which were converted to zero-degree storage in several steps over a two-year period starting in 1944. The layout including floor defrosting schedule is illustrated in Fig. 1. The rooms have been in virtually continuous service since 1944.

Design of Thawing Systems

When the new tenant moved into the Eleventh Avenue facilities and it became necessary to completely restore all the floors we decided to arrive at some scientific method of figuring the load and designing the job. An engineering analysis was made of several of the jobs already installed to determine the following points:

1. How much heat has to be put under the floor with respect to the theoretical amount of refrigeration coming through the insulation. (Heater size)



DATE	ROOM 4	ROOM 3	ROOM 2	ROOM 1
Dec. 1944			Started Freezer Temp.	Started Freezer Temp.
Nov. 1945	Started Freezer Temp.	Started Freezer Temp.		
June 1946			Heaving Commencing	Heaving Commencing
Dec. 1946	Heaving Commencing	Heaving Commencing		
June 1947			Floor and columns up 5/8". Growth apparently stopped.	Floor and columns up 5/8". Growth apparently stopped.
Dec. 1947	Heaved 2"	Heaved 4"		
Jan. 1948			#1 room took all the appropriation, due to drilling expense, so nothing done.	4 KW (13650 BTU/Hr) Total Heat in 5 pipes under slab. Floor started down in 14 days. Restoration complete in 3 mo.
Feb. 1948	1.6 KW (5500 BTU/Hr) of heat in one 2" pipe. Floor down 1/2" in 2 mo. and stopped. Later started up.	1.6 KW (5500 BTU/Hr) of heat in one 2" pipe. Floor down 1/2" in 2 mo. and stopped. Later started up.		
April 1948	Increased heat to 2.4 KW. (8190 BTU/Hr) Floors stopped, later started up again. Concluded: pipes too far apart, not enough heat, or both.	Increased heat to 2.4 KW. (8190 BTU/Hr) Floors stopped, later started up again. Concluded: pipes too far apart, not enough heat, or both.		
June 30, 1948	Temperature off room.	Temperature off room.		
March 1950	New tenant. Building required remodeling and floors had to be brought down for a conveyor system. At this time made engineering study of all floor heaving jobs and determined design factors. Also concluded to replace electric heat with gas fired water heater as electric operating cost approximately $70.00 per month. Electricity 3/4¢ per KW. Gas 5/8¢ per 100 cu. ft. Entire floor heat gas bill now $22.00 per month.			
Theoretical heat required	13,000 BTU/Hr. (Ground temp. assumed 60°)	16,000 BTU/Hr.	5400 BTU/Hr.	5,000 BTU/Hr.
Apr. 27, 1950			Temp. off room. Installed three 2" pipes, connected portable steam cleaner to rush thawing. Frost down 7 ft.	Temp. off room.
May 1, 1950	0° temp. back on. Floor almost down.	0° temp. back on. Floor almost down.		
May 4, 1950			Applied 48,000 BTU/Hr. from steam boiler.	
May 19, 1950			Started circulating 180°F water.	Started circulating 180°F water. This room has more pipes; getting more floor heat than needed.
June 7, 1950	Heaved rapidly. Up 7".	Heaved rapidly. Up 3½".		
June 8, 1950	Started circulating 180°F water in 1 pipe. Found electric cable had burned out.	Started circulating 180°F water in 2 pipes. 2" electric pipe had bad leak; replaced.		
	These two rooms combined - 31,000 BTU/Hr. applied - 29,000 calculated requirement.			
July 10, 1950			Down 2", 0°F temp. back on.	0°F temp. back on.
Aug. 15, 1950			Restoration complete.	
Sept. 9, 1950	No change in floor.	Floor starting down.		
Oct. 22, 1950	Doubled pipes to hurry restoration.	Doubled pipes to hurry restoration.		
Nov. 26, 1950	Not moving.	Down 1-1/2".		
Mar. 17, 1951	Partly restored.	Almost restored.		

Fig. 1—Layout of the Eleventh Avenue plant is shown along with a chronological summary of the work done to cure the frost heaving problems.

Fig. 2—View into pit showing pipes inserted under a freezer floor. The second run was added later and water flow is in series.

At right a workman is drilling under floor with the 3 hp air motor and water connection.

2. What is the heat transfer factor of 2 inch pipe buried in the ground. (Btu per hr per degree per lin. ft) This information is needed to determine how much pipe to use and how hot to run the water.

3. What is the maximum pipe spacing.

4. What kind of pipe is required—black, galvanized, copper.

This engineering analysis sheet used the following headings: (1.) Job location. (six jobs). (2.) Application (storage, ice tank, etc.). (3.) Temperature difference — brine to ground. (Ground temperature is to be 32 F since it is to this temperature plane that we desire to work). (4.) Gpm circulation. (5.) Temperature water in and out. (6.) Range. (7.) Btu per hr input. (8.) Lin. ft. of 2 in. pipe. (9.) Pipe spacing. (10.) 2 in. pipe heat transfer factor (Btu per hr per degree per lin. ft) (11.) Theoretical floor refrigeration loss.

From this engineering study it was concluded:

Conclusions From Study

1. Heat input should equal floor refrigeration loss. The analysis showed floors with more heat input than theoretical floor refrigeration loss were sinking; those with equal heat input were not moving; and those with less heat input were rising.

2. 2" pipe heat transfer factor equals 1.75 to 2.25 (Btu per hr per degree per lin. ft).

3. Pipes should be spaced between a minimum and a maximum distance. 16 ft centers are reasonably safe, but not positively so No. 4 room at Eleventh Avenue had to have closer spacing. 20 ft centers are the maximum. These centers apply to maximum tip distance if pipes are put in radially.

4. Pipe should be copper if heat is applied on account of the accelerated chemical action on warm pipe in the ground. (When we pulled pipes that had electric heat we found them badly rusted in occasional spots about 6 to 10 in. long). Galvanized pipe would probably be satisfactory if no heat were applied. We hope to reduce water temperature on our installations when the floor levels off. Probably it is best to use normal temperature water if possible.

Installing Under-Floor Pipes

Two reasons for our long suffering from heaving floors, before we went to the mat with the problem were the difficulty in finding some one to drill horizontal holes under floors and the cost involved. The only concern we located was a core drilling outfit, and the best price was $2.00 per foot. (The hole diameter was approximately four inches). Before contacting a drilling outfit, we assumed pipes could be jacked under, the same as conduit under a concrete roadway; but no one would undertake jacking pipes the distances required through frozen ground.

Checked with Gas Company

We finally checked with a local gas company who solved our problem and as a matter of fact, loaned us the equipment with which our own maintenance crew did the work for our first job. We now use a 3 hp air motor with special water head to drive the drill. Air comes from our 40 hp, 110 lb pressure, portable, electrically driven air compressor which stays "cut in" about two-thirds of the time when the drill is operating. The drill rod is one-inch, extra-heavy pipe with oil field couplings. Length of drill sections is governed by how much is involved in providing a pit if below ground level. The drill is the earthworm or fish-tail bit type with center hole for water feed and about four feet of 2 in. guide pipe, and drills a three and one-half inch diameter hole.

Two men are required to hold the air motor and apply drilling pressure in frozen ground. The drill is advanced in about one foot increments. The drill water runs continuously and tends to thaw out the ground during the few minutes pause between the 12 inch advances. Water is kept at a minimum; otherwise the hole gets too sloppy. It seems that the hole runs reasonably level although there

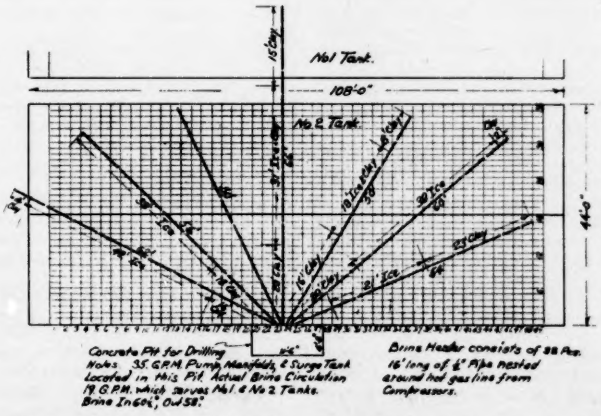


Fig. 3—Typical ground defrosting system installed under an ice tank from a pit on one side. Pipe lengths are shown and also the soil conditions at the time of drilling.

is some drop on the inboard end, possibly 12 inches in 80 feet. Immediately after the hole is drilled, the two inch pipes are inserted to avoid the danger of a cave in. With the above equipment and procedure two men can drill eighty feet of hole, install the two inch outer pipe and move in six hours. Entrance holes through the exterior concrete foundation walls must be drilled or broken out with conventional concrete drilling equipment.

Piping Design

We have used two inch pipe with ¾ in. inner pipe and a ¾ in. plug at the entrance head assembly so that a thawing needle can be used in the event of a freeze-up. This occurred, much to our surprise, on the Eleventh Avenue job: when the circulating water accidentlaly stopped for a day or so after the system had been in operation for a couple of weeks. It would be better to use ½ in. inner pipe so that, in the event the two inch outer pipe failed, a 1¼ in. liner pipe could be used. On new construction two in. trombone coil is laid under a slab, with pipes on about ten feet centers and ends brought out and capped for future connection in the event that heaving develops. Some thought has been given to optimum depth of these pipes, but no checking or research has been done. Any convenient distance under the slab, 12 inches or so, seems to work satisfactorily.

Heat Sources

All kinds of heat sources have been used to date. On some small jobs a circulating pump has been connected to the plant domestic water heater. This method has the disadvantage of having to use 130 degree water, whether needed or not, with resulting accelerated corrosion on the two inch galvanized pipe unless pipe or pump is connected to provide mixing of the return water. Other jobs use condenser water. Still others use a nest of pipes around the compressor discharge line for heat source. Some others use a coil in the cooling tower pan as a part of a closed system which has a surge tank and is charged with calcium brine. Oil or brine can be used.

This appears the safest and best method, especially if the under slab piping system is such that a thawing needle cannot be used. Furthermore any leaks can be readily detected by the oil or brine loss. Eleventh Avenue uses a package unit ordinarily sold for pipe in floor heating systems. The total load here is 39,400 Btu per hr plus about 25 percent miscellaneous line losses. The unit, (smallest available) has a rated minimum input of 70,000 Btu, and a maximum of 110,000 Btu, with 20 gallons, 8½ ft head pump, and fully automatic controls. This is a closed system so it uses a surge tank and plain water treated for corrosion and scale.

Scrap Steel a Necessity Says NPA Booklet

AIMED to help increase the current dangerously low iron and steel scrap inventories in this country, the National Production Authority, U. S. Department of Commerce, is distributing a booklet, "Scrap for Steel Mills and Foundries for Defense," to more than 200,000 executives of business, industry and trade associations.

In a foreword to the booklet, DPA Administrator Manly Fleischmann says, "I don't believe we are confronted with a more critical problem than the iron and steel scrap recovery program."

The booklet emphasizes that record-breaking steel production and large scale expansion of production capacity has reduced scrap inventories of mills and foundries to a new all-time low, with some plants having only a few days scrap supply on hand. If the nation is to achieve its 1951 goal of 110,000,000 tons of steel ingots and castings, 36,000,000 tons of purchased heavy industrial scrap must be found, the booklet says.

Program for Recovery of Scrap

Following is the program outlined for the recovery of dormant scrap:

1—Go after dormant scrap. Start an emergency inspection and inventory of all heavy steel, whether machines, equipment, beams, or plates. Dispose of everything you possibly can to a scrap dealer.

2—Appoint someone with authority. It is important that the top executive of every industrial and commercial establishment, large and small, appoint someone with authority to clean out dormant scrap and to be responsible for a continuous good-housekeeping job.

3—Salvage committee. In large industrial firms the chief executive should appoint a salvage committee with authority to make decisions. The committee should—

(a) Search all plants and properties, regardless of size, for dormant scrap such as obsolete machinery, tools, jigs, dies, and other equipment, including items that are broken, dismantled, worn beyond repair, abandoned, or in need of parts that can no longer be obtained; (b) Survey potential wrecking and dismantling projects that will produce scrap; (c) Dispose of all production and dormant scrap as quickly as possible.

4—Put scrap collection on a "housekeeping" basis. Besides increasing the supply of iron and steel scrap, continuous scrap recovery from questionable old standbys, obsolete machines and equipment reduces taxes through inventory writeoff, improves safety conditions, gives lowered insurance rates, and clears valuable space. Make it the personal responsibility of the committee chairman to initiate a program that will clean out the dormant scrap from the plant. It is suggested that the committee make surveys not less than every 30 days. Make your organized permanent salvage program a top-management responsibility.

"Dormant" scrap is defined as obsolete machinery and equipment, tools, jigs, dies, and fixtures, including items that are broken, worn beyond repair, dismantled, abandoned, or in need of parts that are no longer obtainable.

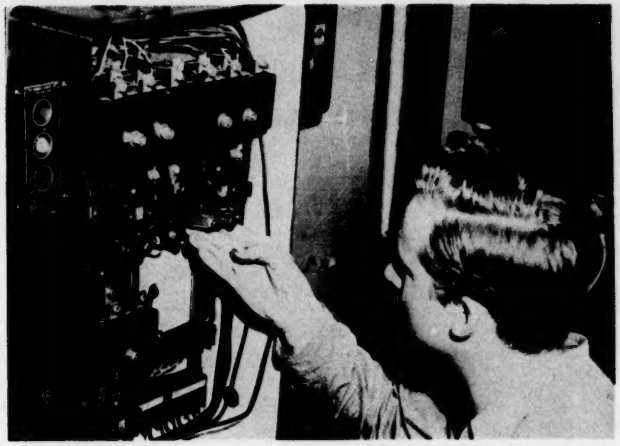
Groups Taking Part in Recovery Program

The booklet lists the groups taking part in the scrap recovery program. Industrial and commercial firms, entire industries such as the railroads, petroleum and auto wreckers, industrialized cities, federal government agencies and trade associations have already established Salvage Committees and programs. The Chambers of Commerce have assisted in organizing more than 800 local scrap mobilization committees of leading industrialists and business men.

After the harvest season, farmers and ranchers have been requested to search out scrap from their farms and barns.

Governors of 48 states and the territories have also appointed scrap collection committees to conduct state, county and municipal recovery programs.

NPA emphasizes that this is not the house-to-house type of scrap campaign carried on in World War II. It is, rather, directed at those business and industrial executives who have the authority to determine what can be scrapped, order the disposal through normal channels and arrange to have obsolete equipment written off.



Checking contactor assembly by hand. Freedom of action is important in control mechanism. To obtain good, positive action the control should be clean —free of dust, grit or oil accumulation. Contact surfaces should be adequate to carry the load without rapid deterioration.

PREVENTIVE MAINTENANCE FOR ELECTRICAL EQUIPMENT

Stepped-up production schedules emphasize the necessity for an organized plan of preventive maintenance for all types of electrical equipment in any industrial plant.

OLIVER J. RUEL
Head, Dept. of Electricity
David Rankin Jr. School of Mechanical Trades
St. Louis, Mo.

AN organized plan of preventive maintenance on all types of electrical equipment is a vital necessity in the effective and economic operation of any plant or industry. Stepped up production schedules with the attendant increase of plant burden, coupled with significant shortages in electrical materials and renewal parts, spotlights the need, to even a greater degree, for all plant engineers and operators to exert every effort to circumvent the possibility of costly electrical shut-downs. *Preventive electrical maintenance is the answer.*

A large percentage of electrical troubles occur as the end result of inadequate inspection and maintenance. Too often electrical equipment is installed and then neglected to a major extent. As a consequence, faulty operation results with a distinct possibility of more serious trouble to follow. A great number of electrical failures in all types of electrified industries can usually be traced to causes so commonplace that they are prone to be overlooked, or felt to be unimportant. It is the attention to the little things, the seemingly minor maintenance practices, that save countless dollars in electrical operating costs.

Preventive maintenance means good care. Too frequently people think of maintenance after the equipment has broken down or its effectiveness has been seriously impaired. This is actually a repair operation which should be avoided by good foresight and regular preventive maintenance.

Keep equipment clean and dry. That is the fundamental. Maintain exact records of the actual condition of the insulation by regular inspection and tests, Professor Ruel emphasizes and gives detail directions for following through the whole program. That is the way to insure reliable service from electrical equipment at minimum cost.

Selecting the Plan

An effective maintenance plan should be constructed to fit the needs of the specific plant on the basis of a general catalog and inspection of all electrical equipment. Following this, a *realistic* and *workable* program should be formed, and then, *carried out*. Whether the program be comprehensive, or rather moderate in scope will depend largely on the plant, the amount and type of equipment, and the man-hour demand required to fulfill its provisions. Regular routine inspections administered by responsible persons who are qualified to perform the work or to make the necessary recommendations, should be the nucleus around which the whole program revolves.

Records Are Important

The recording of pertinent operating conditions of the equipment as it is being inspected is extremely important. This information when properly recorded and filed becomes the index of future trouble possibilities.

Fig. 1—Dust accumulation on windings, leads, cummutator, and brush rigging encourages electrical breakdown.

Any departure from usual or normal operating constants over a period of time may signal a cumulative growth of electrical trouble that some day may amount to a serious interruption or a major outage. An accurate, up to date record should be kept of all electrical and mechanical work that has been performed so as to form a backlog of service information, and a guide to assist in stocking renewal parts.

Record data forms vary with the program. In a good many instances the operating engineer may want to design his own record form to fit the particular needs of his plant and his own particular maintenance program. In other cases printed forms may be secured from many of the electrical manufacturers who are interested in the promotion of good maintenance programs among their customers. Often these forms may be procured without charge.

Care of Motors and Generators

Perhaps the greatest enemy of reliable d-c and a-c motor and generator operation is *dirt*. Keep each machine free of dirt and oil by the industrious use of clean, dry, wiping cloths. Avoid the use of waste in cleaning electrical machinery and apparatus. Make sure that accumulated dust is not blocking off any of the ventilating channels. Serious overheating of the windings may follow.

Certain types of dust are abrasive to insulation and should be removed by suction. This method is also employed for the removal of carbon and copper dust, which if left undisturbed may eventually form leakage paths for the electric current with resultant damage to the windings. Ordinary dust may be blown out with moisture free compressed air using pressures of approximately 25-50 lb per sq inch. Good safety practice encourages the use of goggles and a protective mask when blowing out.

If the dirt is largely an accumulation of oil or grease, cleaning with an approved solvent may be necessary. The solvents generally used for this purpose are the petroleum distillates, carbon tetrachloride, or in stubborn cases, a mixture of the two has been found effective. Always exert great caution and employ all safety rules when working with cleaning solvents to avoid the danger of explosion, fire, or toxic effects. Cleaners Naptha or Stoddard Solvent is effective for the ordinary type of cleaning. In order to avoid deterioration of insulation all excess solvent should be carefully removed after the cleaning has been performed.

Insulation Resistance

Another important factor having a direct bearing on the operation of electrical machinery and most other electrical equipment is *moisture*. Moisture tends to reduce the insulation resistance of wires, windings, and cables—thus paving the way for breakdown and burnouts. A good maintenance program provides for regularity of insulation resistance tests by either a megohmmeter, or, if this instrument is not available, by a high resistance voltmeter connected in a special manner which will be discussed later on. The use of the megohmmeter is favored over the voltmeter method because of its ability to search out the deep seated troubles, the fact that it contains its own source of testing voltage (the unit is equipped with a hand cranked generator), and because the meter in the instrument is calibrated to read directly in megohms (1,000,000 ohms).

Test For Resistance

In any test for insulation resistance be sure that the object under test is disconnected from all sources of voltage except that of the test source. Fig. 2 illustrates several applications of the "Megger"[1]. These examples indicate only a few of the many uses of this important instrument. When the crank is revolved at the proper speed the value of the insulation resistance under test is indicated on the calibrated scale.

The voltmeter method is illustrated in Fig. 2 and shows the armature of a DC motor being tested for insulation resistance. This method may be extended to entire machines, cables, or wiring circuits of any nature.

To apply the test proceed as follows:

1. Close the switch to "A" and read the voltmeter. Call this voltage E.

2. Close the switch to "B" and read the voltmeter. Call this voltage E_1.

The formula for the value of Rx, the insulation resistance is:

$$(1)\quad Rx=\left(\frac{E}{E_1}-1\right)Rv$$

Where Rv is the resistant of the voltmeter in ohms.

EXAMPLE: On an insulation resistance test of a certain motor the voltage of the line (position "A") was 115 volts. When the switch was moved to "B" the reading of the voltmeter was reduced to 45 volts. The resistance of the voltmeter used in the test (Rv) was 75,000 ohms. What is the value of the insulation resistance?

Substituting in (1) above:

$$Rx=\left(\frac{115}{45}-1\right)x75{,}000=116{,}662 \text{ ohms.}$$

[1]Trade mark registered James G. Biddle Co.

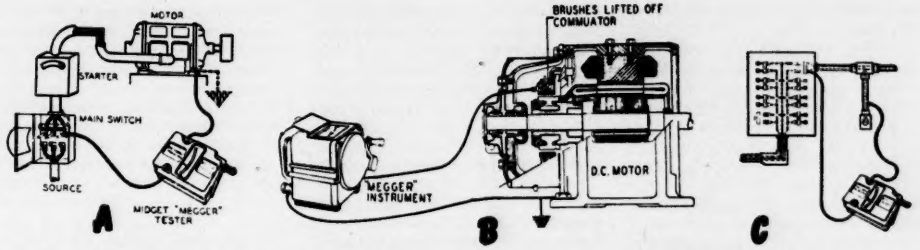


Fig. 2—Various methods of measuring insulation resistance. The "Megger" is used in the testing of all types of electrical machinery, cables, potheads, insulators, bushings, circuit breakers, mercury-pool rectifiers, and many other items of electrical equipment.—Drawings, courtesy James G. Biddle Co.

(A) A-C Motors and Starting Equipment. Connections for testing the insulation resistance of a motor, starting equipment and connecting lines, in parallel. Note that the starter switch is in the "on" position for the test. It is preferable always to disconnect the component parts and test them separately in order to determine where weaknesses exist.

(B) D-C Generators and Motors. With the brushes raised—as indicated—the brush rigging and field coils can be tested separately from the armature. Likewise the armature can be tested by itself. With the brushes lowered, the test will be that of brush rigging, field coils and armature combined.

(C) A Test of Wiring Installation. Work from the distribution panel and each separate circuit is tested to ground.

It is important that all insulation resistance test results be filed for future reference. For example, if a cable or a machine has an insulation resistance of 0.1 megohm when tested today, and upon checking the records it is found that the same cable or machine had an insulation resistance of 0.15 megohm when tested 12 months previous, it is apparent that the insulation had deteriorated. A close examination of all factors that could lead up to this condition is in order. One important point that must be observed in insulation resistance testing is that the insulation will check higher in value when cold than when hot. Therefore, for comparison with previous test results the conditions of test should be similar.

Lubrication

One of the top items of importance in the uninterrupted operation of electrical machinery is correct lubrication. Proper lubrication administered on an organized schedule by a conscientious inspector is one of the salient points of any well-planned maintenance program. Avoid under-lubrication and over-lubrication. Bearing failure, high on the list of breakdown factors is a direct result of both—depending on the type of bearing. Over-lubrication encourages the absorption of excess oil by the windings, which, combining with dust impairs the insulation and clogs up ventilating channels. Whenever possible avoid the oiling of any machine when it is in motion. Use the proper oil or grease, in the right amounts and in accordance with the specifications for the machine being serviced.

Vibration

Vibration caused by loose motor mounts, loose couplings, misalignment, end thrust, and unbalanced loads is a contributing cause to noisy operation, burnt out bearings, and physical breaking of parts due to fatigue. "Line up and tighten up" should be a "must" in the inspection and maintenance program.

Air Gaps

Air gaps should be checked periodically to determine bearing wear. Air gap feeler gauges are made for this purpose and should indicate a uniform gap between the rotating and stationary members of the machine when inserted at 90 degree intervals around the air gap circumference.

Air gaps vary in dimension with the size and type of machine. Induction motors for example, have shorter air gaps than comparable direct-current motors. Values of minimum air gap dimension should be assigned to each machine and when that point is reached, new bearings should be installed.

Collector Rings

Alternators and synchronous motors employ collector rings whose function is to route direct-current to the revolving field circuit of the machine. Wound rotor induction motors on the other hand use collector rings to facilitate torque and speed adjust-

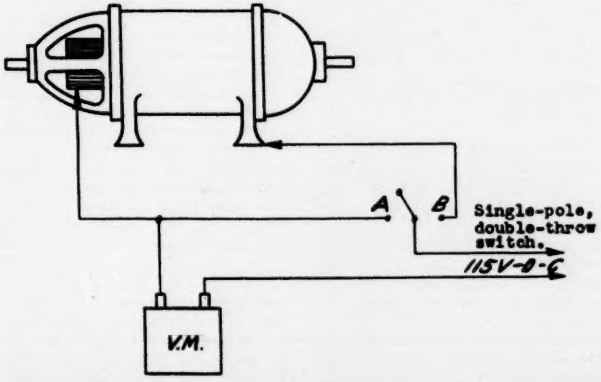


Fig. 3—The voltmeter method of insulation resistance measurement.

ment through the use of externally connected resistors.

Frequent inspection of collector rings is desirable to offset sparking at the brushes, pitting, and the formation of black spots on their surface. Many cases of trouble appearing in synchronous motors and wound rotor induction motors are directly traceable to improper care of the rings, the brushes that contact them, and the brush rigging.

Check for insulation resistance between ring and shaft. Examine the insulating bushings and collars for cracks. Any accumulation of dust which may contain conducting particles might precipitate flashover between the rings. Moisture or acid fumes sometimes are responsible for brush imprints on the surface of the ring. These marks are formed when the machine is at rest and appear at surface points not covered by the brushes. As a result, surface contour is impaired and jumping of the brush as it passes these points will produce sparking and ultimate burning of the surface. An unbalanced rotor in many instances will be the cause of small arcs produced every revolution which will form the imprint of the brush on the surface of the collector. Characteristically, brush imprints due to a mechanically unbalanced rotor will always occur at the same spot. Conversely, imprints caused by corrosive action are distinguished by the formation of marks at any point where the rotor happens to come to rest.

A good method of removing these spots is to apply fine sandpaper to the surface of the rings. The polarity of iron or steel rings carrying direct-current should be reversed periodically to offset the electrolytic action that affects these materials. Better wear of the rings will result. Proper choice of brushes and correct staggering, coupled with fair end play does much toward the surface upkeep of the collector rings. Excessively pitted rings may require grinding.

Care of the Commutator and Brushes

Good commutation of d-c generators and motors as well as commutator types of a-c motors stands high on the list of essential maintenance points. When properly maintained the commutator will give satisfactory service under normal load conditions with a minimum of sparking and burning of bars or brushes.

Of prime importance to efficient commutation is the necessity for continuous, close fitting contact between the surface of the commutator and the brushes. This is equally true for brushes that are associated with collector rings. In order to achieve this, the commutator must be concentric within small limits, be free from high or low bars, be smooth and devoid of grooves, and not be plagued with high mica. Improperly fitted brushes, ones that are not of the proper length, are loose, or sticking in their holders, or that are not set at the correct angle, or brushes with either too small or too great a tension—all contribute to undesirable sparking, burning, and noisy operation.

Conditions of overload also cause sparking, and a common cause, especially in machines not equipped with commutating poles is the incorrect setting of the brushes with respect to the neutral position. A more serious type of sparking is produced by winding faults in the armature. A short-circuited coil, one that is open-circuited or that is afflicted with loose connections, all cause sparking.

Sanding Commutators

Commutators may be kept smooth by occasional light sanding with No. 00 sandpaper. A canvas pad fastened to a wooden stick and held against the surface of the commutator will do a good job of cleaning as the armature revolves. If a commutator becomes excessively rough, resurfacing is necessary. This is done by grinding with an abrasive stone mounted in a special rigging. This apparatus is equipped with a suction arrangement that removes all dust during the grinding process.

Most modern machines have undercut mica. Frequent inspection of the undercut slots between the segments of the commutator is advisable in order to determine the presence of dirt or conducting dust. Failure to remove any such accumulation poses the possibility of segment short-circuit. Slots may be cleaned by the use of any one of the many excellent tools manufactured for this purpose.

The selection of brushes to be used on any machine should follow the recommendations of the manufacturer or other competent brush authority. In replacing brushes the sanding operation on the brush should start with coarse sandpaper and continue until the brush surface is brought down to the general shape of the commutator or collector ring. Always pull the strip of sandpaper through in the direction of rotation the machine has when running, keeping the ends of the strip as close to the surface of the ring or commutator as possible. Exert a firm pressure on the brush. Follow the coarse operation with a treatment of fine sandpaper under normal brush tension. Under no circumstances use emery in the fitting of brushes for electrical equipment.

Brush tension should be regulated in accordance with the specifications for the machine. In the event this information is not available, a good rule of thumb to follow is approximately 2 lbs. per sq. inch for carbon brushes and 3 to 5 lbs. per sq. inch for metallized brushes on collector rings.

Care of Motor Control Devices

Just as important as the motors themselves and equally justified in the maintenance program are the devices that are charged with the responsibility of initiating the start and safeguarding the machines while in operation. This includes equipment to start and stop the motor, regulate speed, provide protection, reverse direction of rotation, apply excitation current, and many more extremely important duties. Whether the controls be manual or automatic, d-c or a-c, they all require, and should have, their share of discerning inspection and maintenance.

An important point to acknowledge in the operation of all electrical equipment is the maintaining of tight connections. Loose connections are responsible for a great number of operating difficulties because they introduce "contact resistance". Loose terminals, insufficient contact area on switches and circuit breakers, fuses that do not fit snugly in their holders, loosely fitting contact points with insufficient pressure—all usually result in erratic and inefficient operation of the apparatus they are associated with. More important than this, however, is the fact that an excessive amount of *heat* is developed at the point of loose connection when current flows. An increase of heat produces an increase of oxidation which in turn increases the amount of the contact resistance—resulting in further heat, and so on. The inevitable result of this cumulative action is to finally destroy the contacts or otherwise render inoperative the part of the circuit so affected.

Overload relays that employ heaters may be seriously affected by loose connections which develop localized heating and nullify the protective settings of the relay. This results in unexpected shut-downs with loss of production or facility. Contactor points should be examined carefully for the effects of oxidation and consequent increase in contact resist-

ance. Oxide may be removed by the use of sandpaper or by careful filing. Under no circumstances use emery cloth because of the probability of conducting particles forming short-circuit paths in the mechanism. Silver contact tips will not require filing because the silver oxide formed on the contacts is self reducing.

Clean and Dry

Cleanliness is essential to the correct operation of any control device. Any accumulation of grease or dirt acts to impair faithful and positive action of the control. Dry dust may be blown off with moisture free compressed air using pressures of from 25 to 50 lb. per sq. inch. In stubborn cases involving heavy dirt, oil, or grease, the use of carbon tetrachloride applied sparingly is effective. Follow this up with a good wiping job.

Evidence of moisture is a serious menace to control equipment. Moisture causes insulation breakdown with resultant electrical leakage paths which can by-pass protective and control circuits causing unpredictable and dangerous conditions of operation. In some cases noisy operation of the control can be traced to rust (caused by moisture) forming on the faces of magnetically actuated mechanisms.

All moving parts of the control should operate freely and smoothly. This can be ascertained by periodically checking the operation of the device by hand. Any mechanical binding should be promptly rectified. Do not oil any part of any control device unless such oiling is specified by the manufacturer. Oil collects dirt and dirt breeds trouble.

Resistance Lessened

Contact resistance between any two surfaces is lessened as pressure and area of surface increase. Maintain recommended pressures and guard against insufficient contact surface area. An important point to check in connection with the foregoing is the applied voltage on the operating coils of magnetically actuated contactors. Low voltage causes sluggish action, while high voltage involves excessive current with attendant overheating. The character of the contact surface, that is, whether it be smooth or rough is not as important as it may appear. Experience has shown that smooth surfaces are not necessary, or for that matter desirable. A moderate amount of roughness does not affect the current carrying efficiency. Of course, excessively rough surfaces should be dressed down with sandpaper or a file. If the contact is badly worn—replace it. Good maintenance practice recommends the simultaneous replacement of other contacts in the set as well.

Flexible connections such as shunts are subject to a certain amount of movement which in time causes fraying of the strands. Another enemy of shunts is corrosion which acts as a disintegrating agent. Careful inspection of both mechanical structure and electrical conducting area of the shunt will minimize the probability of improper operation or unexpected interruptions.

Switchboards

Switchboards of any type should be kept clean by occasional blowing out or by the use of suction equipment. Keep a stringent lookout for loose connections, evidence of "hot spots", excessive vibration, and moisture or corrosive conditions. Inspect all points where conductors enter or leave conduits for wearing of insulation. Carefully examine meters for cracked cases or broken glass covers, replacing as soon as possible in order to avoid the possibility of meter inaccuracy and damage. Relays should be free of dust and dirt, should work smoothly, and be periodically tested for calibration by a properly qualified relay man or tester. Switches should be inspected regularly as well as fuses for tight contact and clean contact surfaces. Guard against overloaded circuits and avoid "over fusing".

Circuit Breakers

Breakers should be checked for loose connections, contact surface area, condition of contacts, contact pressure, and freedom from binding. Examine all latching and trip mechanisms for wear and alignment, and make sure that cleanliness is not overlooked. A sticky release device, due to dirt, could prevent tripping with consequent loss of protection. Examine the secondary or arcing contacts for proper positioning and for pitting, and operate the breaker mechanism by hand to ascertain freedom of action. Be sure that all mechanical clearances are adequate for effective operation.

Safety

Finally, any program of preventive electrical maintenance should be correlated with standard safety practices. Above all, avoid the possibility of injury due to accidental closure of switches and circuit breakers when working on electrical equipment by attaching "HOLD OFF" cards where necessary. Be sure the circuit or machine is clear of all sources of power before work is started and keep ample clearance when in the vicinity of live circuits. Perhaps in no field of mechanical work is alertness and good working habits of greater importance. *Good safety pays off—Just like good maintenance.*

In this article some of the more common factors leading to electrical failure in machinery and control equipment have been pointed out. In so doing it was the hope of the author that those persons charged with the responsibility of electrical maintenance work would be encouraged to delve deeper into the more complete treatment of maintenance as represented in current literature on the subject.

Effects of Nitrites in Fish

THE value of nitrites (potassium and sodium) in fish preservation is reported in a progress report issued by the Fisheries Research Board of Canada. Pure food regulations of Canada permit inclusion of not over 200 parts per million of sodium nitrite in fresh fish.

Nitrites, it is reported, have the following effects: They retard bacterial spoilage and thus reduce formation of undesirable trimethylamine, increase color slightly (especially salmon, and more noticeably after cooking), delay rancidification in unfrozen fish at temperatures near 32 F, but promote rate of fat oxidation and rancidification in stored frozen fish. These values were established about 12 years ago.

Work on antioxidants, begun about six years ago, has established the value of ascorbic acid, which, however, must be handled carefully because of its cost. It can be applied beneficially to fish as a dilute solution in water or brine for fillets or steaks, or as an ice glaze for frozen steaks or whole fish. Use of seaweed extractiges or other thickeners in the dipping solution seems to hold the ascorbic acid in place and to reduce the amount required.

Studies on Gulf Shrimp

THE Experiment Station of Louisiana State University in Baton Rouge, will continue studies on refrigeration of Gulf shrimp, under the leadership of Dr. E. A. Fieger. These studies are made possible by a grant of $1,000 from the Refrigeration Research Foundation.

Corrosion in Refrigerator Cars Reduced

AFTER nearly two years of research, chemists at the Canadian National Railways research laboratory at Montreal have perfected a chemical combination which inhibits the reaction of salt on the metal of refrigerator cars. It is expected that this may extend the present life of refrigerator cars and save the company large maintenance costs.

The problem of finding a substance to counteract the wear of salt added to ice on metal equipment was handed the department of research and development in 1949 and S. W. Fairweather, vice-president, called on chief chemist E. T. Hurley and his staff to find a solution.

Data on Corrosion Rates

Their first task was to obtain accurate statistics on the corrosion rates of brine solutions at various strengths. To do this they obtained 12 steel panels each 3.8 cm. by 2.3 cm. After a scrupulous cleaning, these panels were weighed and attached to an electrically driven apparatus which was regulated to immerse the panels into individual salt solutions of varying strengths and raise them again into the air. After seven and one-half hours of intermittent dipping, the panels were left suspended in air for sixteen and one-half hours and again subjected to the dipping operation for an additional four hours.

At the end of that time, the panels were reweighed. Comparison of their original weights with those after corrosion showed that the corrosion rate rose with the increased concentration of salt in solution to a maximum of three percent and thereafter decreased as the solution became more concentrated. With these facts in hand, the chemists' next step was to determine what combination of known corrosion inhibitors would prove the most effective in the various concentrations of brine. The method of dipping the steel panels was used again but this time inhibitors were added to the brine solutions in various combinations and strengths. After exhaustive tests they found that a combination of codium hexametaphosphate and powdered calcium chloride was the most effective. It proved capable of arresting 78 to 95 percent of the corrosion rate, depending on the brine concentration.

But the lab men were not satisfied. While the new inhibitor had proved itself under more severe conditions than would be met in refrigeration service, they decided, nevertheless, to try it out experimentally under actual operating conditions.

Down the hatch. One of the three refrigerator cars set aside for testing the new corrosion inhibitor was serviced recently at Montreal. E. Traversey, perishable traffic inspector, is seen pouring the inhibitor into the car bunker. Looking on, left to right, are A. St. Pierre, perishable traffic inspector and J. L. Townshend, general supervisor of perishable traffic.

Experimental Cars Treated With New Inhibitor

Three refrigerator cars operating from coast to coast are being treated with the new inhibitor. The chemicals are being placed in their bunkers in proportion to the amounts of brine and ice used. As the inhibitor is only partially expended in the refrigeration process, the research men expect that the surplus, flowing from the car through the drip drains, will tend to reduce corrosion to track and bridge structures.

The proportion of chemicals is: 40 percent of weight of sodium hexametaphosphate; 60 percent by weight of powdered calcium chloride; 0.01 percent by weight of fluorescein.

The fluorescein acts as an indicator to show the presence of the inhibitor by imparting a green fluorescent coloration to the brine solution.

In icing operations, one-half pound of inhibitor to every 250 pounds of ice when no salt is used.

Under each car, chosen for the tests, four panels bearing samples of rail track, tie plate, tie spike and structural steel have been mounted near the drip drains. Inside the cars, other panels have been installed in the wet flues. These bear samples of car rivets, galvanized steel flooring, steel body sheeting and structural steel.

On two of the cars, four bunkers are being treated with the inhibitor while the remaining four are being iced in the usual manner. The third car is being iced without the inhibitor to provide a control test which will indicate the rate of corrosion under normal icing conditions.

Icing stations across the system have been supplied with the inhibitor and personnel at these stations have been briefed in the conduct of the experiment.

Tests to be Evaluated

The cars presently on road test are travelling an average of 100 miles per day. It is expected that they will be returned to the Point St. Charles shops in Montreal in the latter part of November, and an evaluation of the tests will then be made by the company's chemists.

If the results tally with the two-year study made in the laboratory, Canadian National refrigeration cars will have a new lease on life and their life span considerably lengthened.

Warehouse Executive Becomes Capuchin Priest

FOUR years ago Joseph Thomas Adams of Montclair, N. J., gave up a promising business career at 45 to enter the Capuchin Franciscan Order of the Roman Catholic Church. Frater Adams was ordained to the priesthood last month in Boston.

He was president and director of the Manhattan Refrigerating Co. in New York and the Union Terminal Cold Storage Co. in Jersey City until he resigned, convinced his future lay within the church.

The Capuchins are known for their extreme austerity and simplicity. They wear a hooded, brown habit and sandals, and permit their beards to grow. Father Adams celebrated his first mass September 10 in St. Catherine's Chapel, Westfield, Pa.

Eighth International Congress Covers Wide Range of Refrigeration Subjects

THE Eighth International Congress of Refrigeration held in London, England, August 29 to September 11 attracted a large number of technicians and industrialists from some fifty countries. The organizing body of this year's Congress was the British Institute of Refrigeration. The last previous Congress held in London was in 1924, followed by meetings in Italy in 1928, the Argentine in 1932 and Holland in 1936. At the 1924 Congress in London, official delegates from more than forty counties were present and 160 reports and papers were read and discussed. For this year's Congress, the number of papers was limited to 150 so the discussion could more easily be confined to the pricipal subjects.

Those attending the Congress represented many important branches of refrigerating, including manufacturing and food industries. An elaborate program of excursions and industrial exhibits was carried out, as outlined in the July issue of ICE AND REFRIGERATION. The various subjects dealt with were grouped under seven commissions. The various commissions and the papers presented under each by United States authors were as follows:

I. Scientific problems of low temperature physics and thermodynamics.

"Liquid Helium Techniques," A. Wexler and W. S. Corak

"Modern Low Temperature Technique in Ethylene Recovery," G. T. Skaperdas

"Enthalpy Transfer in a Cross-flow Cooling Tower," N. W. Snyder and J. E. Mahlmeister.

"Thermal Conductivities of Some Condensed Gases," R. W. Powers, H. L. Johnston and R. W. Mattox.

II. Physical - technical problems of industrial refrigeration

"The Change in Energy Content of Foods in the Freezing Region," H. E. Staph and B. E. Short.

III. Application of refrigeration to perishable foods with regard to their physical, chemical, and biological characteristics and temperature.

"Changes in the Nutritive Value of Fruits and Vegetables during Chilled and Frozen Storage," W. T. Pentzer.

IV. Refrigeration machinery, refrigeration plants and operation, test methods.

"A.S.R.E. Safety Code and Marine Practice Code," Glenn Muffly

"A.S.R.E. Test Codes for Small Plants," Glen Muffly

V. Applications of refrigeration in cold storage warehouses, ice factories, and chemical industries.

"Recent Advances in Refrigeration and Handling Equipment of Large Commercial Cold Stores and Locker Storage Plants in America," R. Woolrich

"United States Methods and Machines for Making Small Ice," Crosby Field

VI. Refrigerated transport by land and water.

"Mobile Split Absorption System of Refrigeration," Harold C. Hopp

VII. Research, education, general economics, statistics, and legislation.

A number of trips to refrigeration installations and other points of interest in and around London were arranged for the delegates and visitors during and following the Congress.

A more complete report on the Congress will be published in the November issue of ICE AND REFRIGERATION.

Heat Pump Exhibit Attracts Congress Delegates

A HEAT PUMP installed experimentally by the Ministry of Fuel and Power in the Royal Festival Hall at London, England attracted the attention of many delegates and visitors at the Eighth International Congress of Refrigeration. This was a part of the Festival of Britain.

The refrigerant (Freon-12) is boiled at low temperature and pressure in a shell and tube type evaporator wth river water running through the tubes at the rate of up to 1,800 gallons per minute. The vaporized refrigerant undergoes two stages of compression in centrifugal compressors. The compressors driven at speeds upto 17,500 rpm through a suitable gearbox by two aircraft engines each developed 350 bhp. The hot compressed vapor passes through an oil separator and thence into the condenser, also of the shell and tube type. After condensation the liquid refrigerant flows through the automatic valves back to the evaporator. Water from the concert hall, after being warmed by hot gas in the condenser, is used for cooling the engines and finds its way back to the hall through a waste heat boiler, where it takes as much heat as possible from the engine exhaust.

New Research Division On Control of Insects

A NEW research Division in the Bureau of Entomology and Plant Quarantine, the Division of Stored Product Insect Investigations, in which research will be conducted on the control of insects that destroy stored products, has been announced by the U. S. Department of Agriculture. Randall Latta, longtime Bureau researcher on various methods of insect control has been designated acting leader of the new Division, by Avery S. Hoyt, chief of the Bureau. His first assistants will be R. T. Cotton, and Dr. Lyman S. Henderson, bureau authorities on the control of insects that affect stored products in homes and commercial establishments.

Almost every stored agricultural product, whether food, feed, or fiber, is affected more or less seriously by insects. The average annual value of grain destroyed by insects has been estimated at a billion dollars. Much of this loss occurs after the grain is harvested and in farm storage. The value of wool destroyed annually by clothes moths and carpet beetles, whether raw wool prior to manufacture or after it is made into clothing, is estimated at more than ¼ billion dollars. Dried fruits, nuts, candy, dairy products, cured meats, cereals, spices, breakfast foods, spaghetti, and numerous other stored food products and tobacco also are subject to losses.

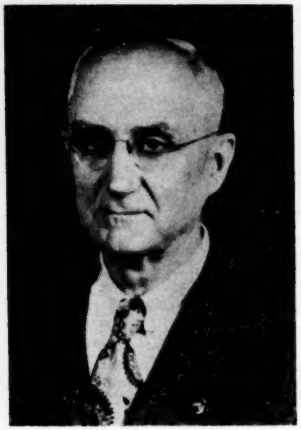
Investigations concerning insects that affect stored products have been conducted in a number of the Bureau's research Divisions. The reorganization will permit better coordination of the research. The public also will be able to secure answers to its problems on the control of such insects from a single source, and industries concerned with problems in their field will have a more centralized point of contact.

Another phase of the investigations will be the control of insects that cause problems during manufacturing or processing. Except for research on control of clothes moths and carpet beetles, this is a relatively new, yet highly important, field. This phase of the research will be centered at the Bureau's laboratory at Savannah, Ga. The present Division of Control Investigations, located at the Agricultural Research Center, Beltsville, Md., also will be incorporated into the new Division.

It will be the duty of the entomologists of the newly established Division to find how insects that destroy stored products can be controlled, so that more feed, food, and fiber, can be made available to the nation.

Practical Refrigerating Engineer

NATIONAL ASSOCIATION PRACTICAL REFRIGERATING ENGINEERS



H. G. Venneman, Lafayette, Ind.
Chairman Educational Committee
National Association Practical Refrigerating Engineers

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Memphis Convention— Interesting Values For Refrigerating Engineers

THE refrigeration industry begins a southern migration when the NAPRE moves into Memphis on November 6-9. It is the first of four national groups that will meet in the south this year. Naturally the region has made great use of air conditioning and that phase will have particular attention on the engineering program. Rapid advance however is characteristic in many other applications of refrigeration. In fact much of the new, widened pattern of southern industrial production is based upon refrigeration.

Good Value

The low cost of transportation from many membership centers has been mentioned. A number will find it convenient to make up groups and drive in private cars. While convention headquarters is in the Peabody Hotel which is an unusually fine hotel, the room rates and costs of other services are moderate. The Memphis

The Hotel Peabody is convention headquarters. Here the convention attendants will enjoy excellent facilities provided in an atmosphere of cordial and friendly service.

The 42nd annual meeting of the NAPRE in Memphis is quite timely. Although definitely in the south Memphis is a very convenient location for attendance by members and others in the industry. This also reduces travel time and transportation costs for the group as a whole. The committee expects a large group of members and guests to take advantage of the excellent opportunities offered by the convention this year.

Chapter Committee has worked to arrange a good entertainment program at low cost and has succeeded. Attendants will be able to enjoy all these events at considerably less than the usual costs. But only the cost, not the quality has been reduced at the Memphis Convention, to give plus value to all attendants.

Great barge-loads of automobiles are regularly unloaded at Memphis for wide distribution in the area. The Mississippi River carries a large volume of heavy freight and is a great factor in the commercial life of the city. The Supply and Repair Depot of the U. S. Army Engineers at Memphis is shown above. It is their job to facilitate commerce on the river and carry out flood and other control operations. Photo by 16th Photo Sqd., U.S. A.A.F. The charm of Memphis is well known to travelers and attractions for visitors remain. At the right is a winding street in the residential section.

Engineering Program

The whole program of the convention has been carefully arranged to give the attendants what they want and can use to best advantage in the field of refrigeration engineering. Many of the speakers are already noted in association circles for the fine work they always accomplish in their papers and discussions. Other speakers who are new on the association programs have been informed in detail concerning the type of material that will prove most helpful and valuable to the membership. In order of their appearance on the program some of the speakers and their subjects are:

"Modern Compressors as Applied to Air Conditioning" by G. E. Hicke, Trane Co., LaCrosse, Wis. Lately a number of new compressors have been offered for this service and many refinements in design have been coming along more or less continuously on machines developed earlier.

"Unusual Conditions in Air Conditioning Operation and How to Meet Them" by Elliott Hallowell, Snell Refrigeration Supply Co., Dallas, Texas. This year the Dallas area has faced peak temperature conditions. The lessons learned there will prove interesting to all refrigerating engineers.

"How to Keep Power Costs at Minimum" by R. A. O'Neill, Central Power and Light Co., Corpus Christi, Texas. Mr. O'Neill is a veteran speaker on NAPRE programs and is noted for the useful information always presented. His subject has universal interest for all engineers.

"Factors That Result in Poor Refrigerating Plant Operation" by C. T. Baker, Atlanta, Ga. In his work as a consulting engineer, Mr. Baker has a fine opportunity to check operations in a broad field of refrigeration work. A frequent speaker on NAPRE programs, his contributions have always been noteworthy.

"Public Relations Possibilities in the Engine Room" by C. W. Burns, Clover Farm Dairy, Memphis. The Production Department is no longer a hidden part of refrigeration plant operations. Progressive companies use their plant in customer relations work. Mr. Burns has done important work in this field of interest to every one.

Frozen Foods

A symposium or panel discussion on "Frozen Food Plants and Operation" will bring together four men of broad and diversified experience in this field. Discussion leader will be Regis Gubser, California Consumers Corp., Los Angeles, along with William Finnegan, consulting engineer, Los Angeles, A. R. Carlson, Railways Ice Co., Chicago and Howard Peterson, consulting engineer, Yakima, Wash.

This event on the program provides an unusual opportunity to obtain up to date information on a very timely subject. Attendants are invited to bring their questions and problems for presentation to this clinic. This section of the program will be completed with a color movie showing the results of research work involving tests in the freezing of various kinds of foods. This film, which has never been shown before, has been produced by Mr. Finnegan, who will also present it.

The subject of electrical servicing in the refrigeration and air conditioning field will be presented by representatives of the Westinghouse Electric Corp. A color-sound movie takes the audience into the actual service and trouble-shooting operations and gives detail explanations and directions. A well qualified lecturer will develop the subject further and conduct a question and answer session. The whole subject is of interest to all refrigerating engineers, not only those engaged in air conditioning work.

Cold Storage

Construction and equipment in cold storage plants have been undergoing marked changes during the past few years. All of this is in line with the desire to keep construction costs in reason and at the same time to provide for rapid handling of goods in and out at minimum cost. "Interesting Features of New Cold Storage Plants by Don Parkhurst, Burge Ice Machine Co., Chicago, will describe features of current practice in this field. A number of noteworthy features in the new Continental Freezers plant at Chicago will highlight this paper.

NAPRE Department

A symposium on ammonia recirculating systems will be led by Professor H. G. Venemann, Purdue University. Associated with him in this round table discussion will be Eugene Rytlewski, Westerlin & Campbell Co., Chicago, C. T. Baker and Don Parkhurst. The use of ammonia pumps has gained rapidly during the past ten years but certain problems have cropped up in a number of systems to complicate operations. A few fundamentals appear to be important in installations of this type. These will be reviewed by the panel and it will also answer questions or problems submitted to it by attendants.

The Bureau of Refrigeration Information is the general question and answer session at the convention. It has become an established feature to which members and others submit their operating problems and questions. At Memphis it will again furnish a valuable service and give an interesting evening to all the engineers at the convention.

The foregoing gives a broad sampling of what to expect at the 42nd annual meeting of the NAPRE. The Educational Committee is arranging other features of equally fundamental merit. Every one who attends the convention will find all this interesting, helpful and profitable.

Entertainment Program

The Memphis Convention Committee has arranged a well balanced program of entertainment to provide diversion and get the convention attendants better acquainted with each other. The general convention events are supplemented by several features to entertain the ladies at the convention. The men are urged to bring their wives because all of them will enjoy the program provided.

As mentioned before the cost involved in the entertainment events will be very moderate so all of the entertainment will represent very good value for the convention group.

Many members of the association live within easy driving distance from Memphis. In St. Louis, Tulsa, Dallas, Ft. Worth and New Orleans they expect to arrange for group travel in this way.

The convention is open to both members and guests. Everyone interested in this field of activity is invited to take advantage of both the engineering program and the entertainment.

N A P R E
Question Box

H. G. Venemann, Professor of Refrigeration, Purdue University and chairman of NAPRE Educational Committee, answers members operating problems monthly in this column. Send questions to Chairman H. G. Venemann c/o Purdue University, West Lafayette, Indiana.

High Pressure Causes

Question No. 895: When the condensing pressure goes up to unusual levels, how is it possible to determine whether the cause is fouled condensing surface, non-condensable gas or some other factor?—L.G.F.

ANSWER: When the questioner speaks of unusual levels of condensing pressure, we naturally take it for granted that something out of the ordinary has happened. Some of the things which may have caused the unusual high pressure are:

(1) additional refrigeration load, (2) diminishing condensing water supply, (3) higher inlet or outlet condensing water temperatures, (4) improper water distribution, (5) fouled condensing surface (6) non condensable gas, etc.

Some of the causes may be determined by comparing the condensing water log data during the period of unusual high pressures with data during normal pressures. Fouled tubes, due to oil, sediment or scale, may be seen upon inspection. Non-condensable gases may be discovered by purging at the proper places in the system. Much has been written about this. We refer you to an article written by Leon Buehler for the N.A.P.R.E. convention at New Orleans. It was published in the 1949 Operating Data Book, and in the January 1949 issue of ICE AND REFRIGERATION.

The correct condensing pressure is one that corresponds with the condensing temperature as found in the ammonia tables. If the condensing pressure is higher than that shown in the table for a certain condensing temperature, the excess pressure is usually due to non-condensable gas. The condensing temperature must be found by locating the thermometer in the condensing zone. An approximate temperature can be obtained by locating the thermometer in the liquid drawing from the condenser.—H. G. Venemann.

Ice Cream Freezer

Question No. 896: Our ice cream freezers do not appear to operate at top efficiency when the condensing pressure is low. Is a certain minimum pressure drop required for ammonia liquid feed to ice cream freezers or could there be something wrong with our method of operation?—H.R.I.

ANSWER: This was answered by E. A. Edmunds who is interested in the Cherry-Burrel freezer and by Leon Buehler of the Creamery Package Mfg. Co. (See ICE AND REFRIGERATION, July 1951, page 46). Both of these gentlemen suggest that under certain operating conditions the pressure may be too low to force sufficient liquid through the valve orifice. These conditions should be anticipated and a larger valve orifice provided by the manufacturers.—H. G. Venemann.

Suction Trap Outlets

Question No. 897: We have problems with liquid refrigerant carried through surge drums or suction traps to our compressors. These traps are adequate size according to the usual authorities and the liquid should be separated from the gas but this does not occur as it should. The suction piping from the traps to the compressor header is probably not as large as it should be. I wonder whether the inlet velocity from the trap to the pipe may not be high enough to pick up some liquid despite the size of the trap and the low general gas velocity through it.

It occurs to me that the machine suction connection to such traps should have perhaps twice the cross-sectional area of the pipe run with a tapered reducer so that the exit velocity from the trap would be reduced considerably. What do you think of this idea? Have you any other suggestions for improvement of this liquid carryover problem?"—S.R.D.

ANSWER: We have answered questions lately on liquid carry over even where surge drums or suction traps had been installed. In most cases the traps had not been properly designed. In one instance the trap was large enough, but one suction line entering the trap was so located as to throw wet gas directly into the main suction line and back to the compressors.

I recommend the article by Eugene Rytlewski on Details for Increasing the Efficiency and Reliability of Refrigerating Plants which appeared in the 1950 N.A.P.R.E. Operating Data

Book. The 1944 Operating Data Book also had some excellent material on this subject by the late A. L. Blatti. One of the most effective suction traps that I have seen in operation was installed over a year ago at the Continental Freezers, Inc. plant at Lafayette, Ind. It is a vertical trap located in the engine room and protects five compressors against carry over from many float controlled unit coolers operating in minus 5 degree rooms with only 8 degrees of superheat. In addition to being of adequate dimensions to insure reasonably good separation the trap is provided with a liquid ammonia coil which operates only when needed to dry out the gas. An electric eye controls the flow of the liquid from the condenser through a solenoid valve if the liquid in the trap reaches a predetermined level in a sight glass. I don't think the tapered reducer would do much good. I would rather spend money to get actual separation in the trap.—H. G. Venemann.

New Questions

Condenser Ratings

Question No. 898: I have assumed that horizontal shell-and-tube condensers could be rated at 10 square feet of tube surface per ton with 85 F cooling water supply and 7 sq ft per ton for 75 F water. Some condensers we recently installed appear to have a capacity considerably above that calculated by the above rating method.

Can you give me the correct surface areas per ton capacity for vertical and horizontal shell-and-tube condensers?—A.F.O.

Brine Cooler

Question No. 899: We have a brine cooling tank in which five banks of 1¼ in. pipe coil are installed. Each bank is 600 feet long; the total pipe is 3000 ft. The coils are in a cube shape tank about 6 ft in each dimension. The velocity over the coils is rather high. Ammonia feed to each bank of coils is controlled by a thermostatic expansion valve. What tonnage would you figure for this brine cooler tank?—A.F.D.

Freezer Room Coils

Question No. 900: In our plant we have a frozen food storage room at 0 F. It has brine pipe coils along three outside walls and across the ceiling. All are plain 1¼ in. pipe. We have calculated the heat load in this room carefully and it totals 5.5 tons of which practically all is wall and ceiling load.

The room contains a total of 4800 ft of 1¼ in. pipe. The temperature difference is 12 degrees F. If we use a conductivity factor, U of 1 Btu per sq ft per deg per hr, the capacity of the pipe figures 2.1 tons refrigeration. At first glance it would appear that the U factor for this pipe is actually 2.6. Is this logical? Perhaps when pipe is used as a heat barrier along outside walls and ceiling, it has a higher rating than when used in bunker coils with gravity air circulation. Your opinion on this would be appreciated.—M.J.B.

NAPRE Department

News Notes and Chapter Activities

Memphis

BY CHARLES CONLEY

THE highlight of the summer season in Memphis Chapter is the Annual Round-Up and Watermelon Party held each August in the air conditioned auditorium of the Memphis Cold Storage Warehouse Co. This is an informal gathering where every one fills up on the best and most delicious watermelon he enjoys all season. The party this year on August 22 fulfilled all the traditions.

Chairman Doug Smith is ready with the knife while an enthusiastic group at the Memphis party stake out their claims: Emerson Brandt, C. E. Stacks, Jim Spalding, Charles Burns, Alvis Clay, Harry Simpson and Charles Conley. At right, following careful instruction by local experts, Emerson Brandt demonstrates the proper attack on one of the Memphis watermelons.

A large group of members and guests came early to the meeting place. Apparently in deference to our guest from the cool north our weather had moderated to some degree from the peak temperatures experienced so much this season.

In Memphis to work on final arrangements for the convention was Emerson Brandt, national secretary from Chicago. He gave a brief talk about convention plans and described some of the features of the educational program which had already been arranged. All the men in the audience were urged to take advantage of the good opportunities which the convention will bring to them this year.

Chairman A. J. Clay of the Educational Committee called attention to the new Refrigeration Course to be distributed to all members beginning in September. He said the officers and committees had voted to make this course a basic part of the regular program of the chapter and suggested that all members sign up prospects quickly so that they could come in without delay and take the course from the beginning.

Excellent entertainment was furnished by Virgil Cox, Esso Standard Oil Co., who showed two full color motion pictures. One showed the many scenic and recreational opportunities in the State of Arkansas along with its rapidly developing industry. The other was an intensely interesting movie made under water in the Bahama island group where a couple of naturalists filmed undersea life. There were many interesting scenes and a number that were rather startling — especially where they made friends with a large shark.

At the conclusion of the program Doug Smith cut up the watermelons and every one enjoyed himself to the full. It was the unanimous opinion that the quality of the melons fulfilled the expected standards which are very high—so the traditions of the affair were maintained again.

The regular meeting of the chapter was held on September 5. John Hines, Materials Handling Engineer for George R. Douglas and Associates showed two colored motion pictures of electric fork-lift trucks and other materials handling equipment. One of the pictures showed the Yale and Towne trucks as they are used in the new addition of the Watertown Freezer Storage Plant, Quincy Market Cold

Storage & Warehouse Co., Boston. This plant stacks the foods 16 feet high on pallets. The goods are arranged on the pallets as they are taken from the truck or railroad car. Then the fork trucks pick up the pallet loads and place them in the warehouse stacks.

The second picture showed all the types and kinds of electric drive handling equipment such as fork trucks, skid jacks, and other equipment which speeds the handling operations.

Recently we have welcomed to membership Louis J. Wells, chief engineer Ford Motor Co., and E. W. Willard, Railways Ice Co., who was reinstated to membership.

Los Angeles

By Fred I. Herr

LOS ANGELES Chapter of the NAPRE held its first meeting of the 1951 fall season at the Terminal Club, Market Place and East 7th Street, on the night of September 5.

In attendance was an exceptionally large crowd numbering well in excess of 100 members and guests. The first order on the program was the serving of the traditional Ham & Beans Dinner. The holding of this dinner on the first Wednesday in September each year has become a traditional gesture with the chapter. It has been held annually for many years and even the World War II period did not halt the practice. In years past the dinner was staged in the Pacific Fruit Express Hall, but in recent times the scene has been the Terminal Club dining hall, adjacent to the auditorium in which the chapter's regular semi-monthly meetings are held.

Following the dinner, the chairs and tables were moved aside to make room for the staging of a rally to raise funds for the Jesse Blair Memorial Foundation. This is the project supported by the NAPRE and several other Southern California refrigeration groups which is sponsoring the construction of a refrigeration research laboratory and enlarged facilities for refrigeration instruction at the Los Angeles Trade & Technical School.

Emmet T. Quinn, past-national president, handled the microphone and developed such enthusiastic response among the members that $150 was contributed toward the fund. Assisting in the rally with appropriate remarks were Art Hess, chairman of the Blair Memorial Committee, and George Paulick, treasurer.

As one part of a fine entertainment program, Ed L. Nelson, committee chairman, provided two interesting films. These were "Ducks Unlimited," and "Idaho—Natural Wonderland," shown through the courtesy of the Standard Oil Company of California.

For the closing part of the two hour show, Mr. Nelson provided a well balanced floor show composed of piano selections; a piano-monologist, whose droll comments on current and other events brought down the house; and a dance act.

Frank Hooper, leader of the chapter's deep-sea fishing enthusiasts, reported on an amazingly successful trip he and his cohorts had taken on August 18, which was one of half a dozen such expeditions Hooper and Rudi Kettler arranged during the summer.

For the August 18 trip, the group had again engaged Capt. Cy Tucker and his well known fishing boat, the "Skipalong." With 13 fishermen aboard, the "Skipalong" chugged out of Newport Harbor at 4:50 a.m. One hour later they hit a school of albacore which provided them with 1½ hours of the most profitable and enjoyable fishing any of these NAPRE expeditions has ever experienced. The albacore were so plentiful, and so eager to be caught, evidently, that they virtually leaped aboard. Even the most inexperienced among the NAPRE crowd had no difficulty landing himself a couple of hefty albacore. Some of the members caught seven or eight of the fish. One man, whose name we were cautioned not to reveal, lost four hook-ups—an unpardonable offense to deepsea fishermen. But so plentiful were the albacore, that he wound up by landing five albacore to redeem himself in noble fashion.

It had been planned to award a prize to the man who pulled in the largest fish. But the action was so rapid, and the fish came over the rail so swiftly and continuously, that all track was lost of who caught which fish, and the contest was called off. The total catch of the 13 NAPRE fishermen was 74 albacore, which are shown in the accompanying photograph, along with their proud and smiling capturers.

Members of Los Angeles Chapter, N. A. P. R. E. aboard the fishing boat "Skipalong" after it had docked in Newport Harbor, Calif., with the 74 albacore they caught on a Pacific Ocean fishing trip August 18.

Standing (back row) C. Nordholm, Capt. Cy Tucker of the "Skipalong," Frank Muzzy, Ray Smith, Frank Hooper, and a crew member.

Front row: A Brohm, Don Clegg, William VanDeren, Jim Delorie, A. Brown, Gregory "Joe" Mai, Dr. E. Loehner, Mac Taylor and Rudi Kettler.

Colton

By H. O. Bonter

OUR meeting was featured by a very interesting lecture on the Carrier-Howard orange juice concentrating system. E. J. Kelley of the Carrier-Howard Co., described how the juice is concentrated so that only a fraction of the space and weight are involved in shipping the juice as compared with whole juice or fresh oranges. The concentrating operations are carried on at low temperature in order to avoid change in juice flavor.

Mr. Kelley drew blackboard illustrations and explained the different stages in the process. Refrigeration is furnished by centrifugal compressors with Freon-11. The juice concentrating industry is growing very rapidly both in Florida and California.

After the talk the group enjoyed the usual lunch. Three new members were elected to membership and two transferred members were introduced.

Yakima

By Elmer Toop

AT OUR FIRST meeting following the summer recess we combined a planning program along with entertainment and a Dutch lunch. The study course for the season was planned. Every one is anxious to get started on the new Refrigeration Course. There is a lot of enthusiasm and we expect to get in some real learning during the year. A group of enjoyable movies was shown. Two of them were travelogs and one was a comedy.

The luncheon committee of Harry Dodsworth and E. A. Wahlstrom did a bang up job even though they had to be reminded about the important item of beer to go with the lunch. They corrected this oversight in short order and all of us enjoyed a good time.

We welcomed R. A. Milliken, Westbrook Packing Co.; and Dan Butler, Yakima Valley Memorial Hospital to membership.

In the inter-chapter membership contest we expect to win but Howard Peterson was officially delegated to do the honors if we don't. Probably this means he will turn up with the free dinner at Memphis.

Chicago

By E. B. JONES

OUR fall season was opened with a well attended meeting and a lively and interesting program. The special event was a symposium on booster compressors with a representative group of equipment men presenting the subject under the direction of Si Rottmayer as moderator. Mr. Rottmayer opened the discussion by asking, "what is a booster system and what is commonly designated as a two stage system? He reported that the common interpretation is that a two stage system is usually designed to handle the total refrigeration load through both stages. On the other hand, a booster system usually only has a portion of the plant load on the booster and the second stage handles a certain amount of the load direct. Mr. Rottmayer then called on various members of the panel to give their thoughts on the general subject.

When boosters are used and what they do was discussed by Don Parkhurst, Burge Ice Machine Co. He said that boosters are usually more economical when the compression ratio goes above 8 or 9. With ammonia single stage systems usually are employed down to a suction pressure of 0 psig. Boosters frequently are applied where a plant already operates at a moderate suction pressure of perhaps 25 psig. An added load at minus 25 to 30 F. would be handled by boosters which would discharge into the standard machines.

One of the primary reasons for installing boosters according to R. A. Klockner, Vilter Manufacturing Co., is to avoid the very high discharge temperature that occurs when a single stage machine is used on high compression ratio. This high temperature not only reduces the lubricating value of the oil but also may break the oil down so that poor operation results.

At an ammonia suction pressure of 10 psig., Mr. Klockner said that two staging will usually pay for itself. When the suction presure drops to a 10 in. vacuum he said the saving runs around 25 percent of the power. This involves a liquid intercooler. Little benefit is obtained from a water cooled intercooler for ammonia on most systems. It is never of any value on a Freon system, Mr. Knockner said.

A diagram of a booster system was drawn by Clarence Neibauer, Worthington Pump and Machinery Corp. He explained the function of the liquid intercooler which chills the refrigerant liquid to a temperature closely corresponding to the saturated pressure of the intermediate gas. Ordinarily the intermediate pressure gas goes to the second stage compressor with about 8 degrees of superhead.

The coil type and the flash type intercoolers were explained. In the coil type intercooler the refrigerant liquid is cooled at condensing pressure and passes on to the low temperature evaporator. In the flash type intercooler the liquid is brought down to intermediate pressure before going to the evaporator side. The coil type intercooler is usually preferred Mr. Neibauer said because of its simplicity and because of the fact that smaller expansion valve equipment can be utilized.

The various types of boosters were listed by Jack Whitson, Westerlin and Campbell Co., as consisting of the horizontal double acting, vertical single acting and VW machines of the reciprocating type. The other two are the rotary and turbo type boosters. He discussed the applications for these different types of machines.

Detailed data was given on the power savings produced by two stage systems under various compression ratios. Mr. Whitson pointed out that the savings produced by two stage equipment depended on a combination of compression ratio and capacity of the system. For example on ammonia systems with 185 lb. discharge pressure it is more economical to use two stage where the load is 25 tons or larger at a temperature of —30 F. At —20 F load there is a lower cost on two stage if the tonnage is 30 or more. When the suction temperature moves up to —10 F the breaking point is 115 tons capacity.

The choice of the type of booster he said depends on the size of the load and the variation in the load. Centrifugal machines are used only on the larger capacity installations. Rotary boosters lend themselves best to plants where the demand is rather stable. Reciprocating machines, he said are well adapted to varying loads.

Some general questions on boosters and two stage systems were discussed by Ed Gaarnas, Midwest Engineering Equipment Co. He stressed the advisability of utilizing oil of a good grade for low temperature equipment. Troubles which have been encountered with oils that produce wax at low temperatures were described. In addition he called attention to the importance of removing oil from the refrigerant before it reaches the evaporator equipment, especially in ammonia systems.

The first lesson of the NAPRE Refrigeration course was presented by Emerson Brandt and the 1951 Operating Data Books were distributed to the members.

A Letter From N. A. P. R. E. President

THE summer season is over. In some cases N.A.P.R.E. Chapters have disbanded meetings during the period and in others the activity has waned due to the heavy rush of refrigeration requirements. A little vacation or slowdown helps all of us. However, the fall season is upon us and we are receiving a fine refrigeration course which will benefit all of us.

The author, Guy King, has done his part in preparing an understandable, concise, and complete book on practical refrigeration for us. The National headquarters have the printing done and distribution is on a regular basis to all members.

Everybody has done his part except—guess who?—you and me! We must avail ourselves of the opportunity by telling all the men about it so that the meetings will start with a bang with all members in attendance. There is only one way to learn something and that is start on page one. This is an opportunity too valuable to miss.

To those of you as Presidents, let me urge you to prod your various chairmen. To the Secretaries, get out the announcements and tell everyone you see when the next meeting is called. The rest of us have equally as big a job in getting our "carcass" out to the meeting and working on other prospects for membership in the N.A.P.R.E.

There are a lot of fellows who want to be in the N.A.P.R.E. You ask them, you will be surprised. It probably is the fellow working right beside us. He needs us; we need him.

There are only a relatively few weeks until the meeting in Memphis. I hope there will be a lot of you fellows there. We want it to be the outstanding meeting of the Society in the last 42 years. Professor Venemann and Emerson Brandt have expended a lot of effort to make the engineering program second to none.

Not only do I hope that you will all be able to be there, but I hope that each of you from your various chapters will be able to report a fine growth in your chapter. With renewed enthusiasm your chapter will be in the strongest position it has ever been. This requires every one of us. The officers have their job to do. Each one of the rest of us have our part. You don't have to wait until you are pushed. You can do some leading by getting in new members that are right beside you.

Ray Burnett of Los Angeles Chapter has set the goal of "5100 in '51". He has organized the competition between chapters and set up the prizes. We can't expect him to get the members we must get.

We expect to announce some new chapters being formed by convention time. A lot of work has been put in on this thing. If each member brought in one new member, we would make Ray feel his time was well spent. We must not let him down!

As we are starting the Fall period, I am looking forward to great results.

HOWARD H. PETERSON
President

New Refrigeration Course Opens

THE first section of the new Refrigeration Course was distributed to all members during September and most chapters began lessons on it at their first October meeting. For the guidance of the instructor in these classes the national office provided an outline which gives the pages of each study assignment and some details of the material covered.

Since chapter programs are not all identical the outline is based on session numbers. Most chapters will cover two sessions each month. The outline will also be of interest to members at large who are studying the course on an individual basis.

Instructor's Outline 1951-52 Season

By Session Number

1 Fundamentals — Study Assignment, pages 1-16. Basic physics, Units of measurement. Thermometers, Heat.

2 Fundamentals — Study Assignment, pages 16-20. Pressure — Daltons Law—Review Questions.

3 Compression System—Study Assignment, pages 21-27. Evaporation — Pressure - temperature characteristics. Pressure cycle.

4 Compression System—Study Assignment, pages 27-33. Temperature and Heat Cycles—Liquid and Vapor Cycle. Standard ton conditions—Review—Questions.

5 Refrigerants—Study Assignment, pages 34-44. Requirements — Physical properties.

6 Refrigerants — Study Assignment, pages 45-61. Specific refrigerants—Changing and handling refrigerants. Review — Questions.

7 Expansion Valves — Study Assignment, pages 62-72. Hand expansion valve—Low side float valve. High side float valve.

8 Expansion Valves — Study Assignment, pages 73-87. Capillary tube—Automatic expansion valve. Thermostatic Expansion Valves—Review—Questions.

9 Evaporators—Study Assignment, pages 88-95. Requirements — Types—Flooded evaporators. Refrigerant pumping systems.

10 Evaporators—Study Assignment, pages 95-102. Dry pipe evaporators—Convection or forced draft evaporators — Review — Questions.

11 Compressors—Study Assignment, pages 103-111. Vertical compressors—Cycles—Indicators. Analysis of Indicator diagrams.

12 Compressors—Study Assignment, pages 111-119. Compressor sizes — Suction valves — Discharge valves. Seals and stuffing boxes.

13 Compressors—Study Assignment, pages 119-129. Lubrication — Cooling—Service valves—Capacity control—Dual effect—Rotary compressors—Hermetics.

14 Compressors—Study Assignment, pages 129-137. Horizontal double acting—Centrifugal Steam Jet—Review—Questions.

15 Condensers—Study Assignment, pages 138-146. Requirements—Operation — Air cooled — Water cooling — Double pipe — Atmospheric—Shell and tube?

16 Condensers—Study Assignment, pages 146-150. Shell and coil condensers — Cooling towers. Evaporative condensers—Review —Questions.

17 Flow equipment—Study Assignment, pages 151-155. Receivers—Pipes and piping — Fittings — Hand valves.

18 Flow Equipment—Study Assignment, pages 158-165. Strainers—Driers and dehydrators — Oil traps. Purgers—Heat Exchangers—Review—Questions.

19 Electric Controls—Study Assignment, pages 166-172. Back pressure control—Temperature control. High pressure cut out—Control applications.

Stockham Joins U. S. Dept. of Commerce

Member-at-large, J. W. Stockham reports that he is associated with the U. S. Department of Commerce, Washington, D. C. His particular activities are in the Office of International Trade, Point 4, Industrial Engineering Department. It furnishes technical assistance to foreign countries including the hiring of U. S. engineers and contracting U. S. Engineering firms as consultants for industrialization of under-developed countries. The natural resources and other conditions favorable to the project in the country are analyzed and a pattern of industrialization is developed to meet the overall situation.

Mr. Stockham declares he is much interested in the new refrigeration course because everything the NAPRE has published has always been thorough, accurate and complete.

Edwin S. Libby

THE death of Edwin S. Libby occurred on August 23 at his home in Chicago, following an illness of several months. He was 72 years of age.

A member of the National Association of Practical Refrigerating Engineers for thirty years, Professor Libby had been made an honorary member in 1937 as a tribute to the great service rendered the association. In 1927 he was elected Chairman of the Educational Committee, a post he filled until 1938. During this period he expanded the service of the question box and added to the engineering publications of the association.

Edwin S. Libby

In the mid-thirties he established the NAPRE Data series and continued it for four years, producing a large number of the data sheets personally. Members fortunate enough to have the series continue to find it a valuable source of reference material. During the difficult war years Professor Libby served a term as president of Chicago Chapter and also conducted its educational course for an extended period.

After graduation from Armour Institute of Technology in 1902 Mr. Libby worked for three years as an engineer. Then he joined the staff of the institute and in 1930 became Professor of Refrigeration Engineering. He retired in 1945.

Professor Libby was held in high esteem by the membership of the NAPRE. Always an interesting and thoughtful teacher, he was also a person of lively interest and good fellowship. A large number of members through out the country enjoyed his friendship through the years.

Surviving are the widow, Lena; two daughters, Mrs. Jessie M. Horrigan and Leila Jeanette, and two sons, Edwin and Ralph.

THE ICE INDUSTRY

NATIONAL ASSOCIATION OF ICE INDUSTRIES

Executive Offices
1706 L St. N. W., Washington 6, D. C.

Executive Secretary
Guy W. Jacobs, Washington, D. C.

President
H. O. McLain, Chicago, Ill.

First Vice-president
E. F. Condon, Los Angeles, Calif.

Second Vice-president
Wm. J. Ayers, Memphis, Tenn.

Treasurer
Geo. Steers, Jr., Kalamazoo, Mich.

THIS MONTH IN BRIEF

The 34th annual convention of the National Association of Ice Industries will be held at the Shamrock Hotel, Houston, Texas, November 13 to 16. The program will be based upon problems in the ice business, what other icemen are doing, selling ideas, new uses for ice, government regulations, advertising, and other subjects of current interest to all ice men.

United States Circuit Court of Appeals rendered decision sustaining previous court decision invalidating all claims of patent on "Sized Ice."

Ice publicity releases in newspapers and magazines during June, July and August hit a new high this year with excellent results.

New cold storage plants for fruit cooling, using block ice for the refrigerating medium are being established in California. Both cost figures and humidity show very favorable results.

The Tri-Pure Ice Company, Kitchener, Ontario, Canada, has completed a plant modernization and expansion program and is now featuring a self-serve vending platform for block ice, crushed ice and ice cubes.

National Ice Convention Expected to Attract Record Attendance

PROBLEMS in the ice business, how other icemen are getting along, new selling ideas, new uses for ice to offset decreased sales, how to find his way through government regulations and red tape, advertising and publicity tools to improve his relations with customers, and merchandising methods that will sell more ice to the commercial trade; these are some of the attractions that draw ice men to their annual national convention.

The 34th annual convention of the National Association of Ice Industries to be held at the Shamrock Hotel, Houston, Tex., November 13 to 16 will supply all of these attractions and more. There is good reason to believe that this year, in view of the magnificent background for the parley, a record attendance will be achieved. With this thought in mind the association is going all out to present a group of speakers of the highest calibre.

Sessions and talks will be brief. Emphasis will be on aptness of subjects presented by lively and interesting speakers. Some sessions will be unusual. If current plans jell, some of the outstanding personalities

The Shamrock Hotel, Houston, Texas

Emerald room of Shamrock Hotel where Convention sessions will be held

in the country will be there to cover vital issues.

Shamrock An Attraction

The Shamrock Hotel itself will be a major attraction. Built by millionaire Glenn McCarthy, it is one of the show places of Texas. Each patron's room in the hotel, regardless of price, has individual air conditioning with a unit under each window which delivers air of correct humidity and temperature, controlled by the occupant. Each room has a conduit for individually controlled television. Loud speaker controls are provided for AM and FM radio programs, music or entertainment originating in the hotel or recorded music.

The largest of the public rooms at the Shamrock, the Emerald Room, will house all convention sessions. It has a ceiling 23 feet high and floor space covers 10,609 square feet. Special curtains can divide space into two, three or four parts. Special lighting and sound features enable users to have a wide range of lighting effects with the simple flick of a switch.

Doors are emerald glass veneer fabricated to resemble huge gems. In each corner is an "emerald" nearly two feet across, cast of lucite. Framed behind scrolls of antique mirrored plate glass are six paintings depicting the serenity of a city at night. Painted in varying tones of white, black and gray, each mural occupies a large recessed alcove, trimmed with milk white satin that contrasts sharply with the emerald antique glass walls.

Out-of-Staters Given Preference

In keeping with the size of Texas, icemen from that state have proposed a plan for making Shamrock reservations that indicates big-heartedness on their part. From General P. A. Weatherred, Southwestern Ice Manufacturers' Association secretary, comes word that the Southwestern Association, acting through its board of directors, invites fellow icemen of other states to come to Texas. In extending this invitation, icemen from the "Lone Star State" will give out-of-state convention-goers first opportunity to stay at the magnificent Shamrock Hotel.

"Since a visit to the Shamrock will be one of the high spots of this year's annual meeting, and since Texans have more opportunity to enjoy the wonderful accommodations the McCarthy hotel affords, we all think it only fair to give those traveling great distances a better chance to make a reservation there," comments the General.

A brochure now being prepared will be sent this month to prospective ice convention exhibitors, describing the excellent facilities available to them at the Shamrock.

Large Exhibit Hall

The exhibit hall, easily accessible to delegates, is large, well-lighted and so planned that all booths can be seen with a minimum of walking. A total of 58 booths, each measuring eight feet square, will be set aside for use by exhibitors.

One of its best features is that the exhibit hall is on the ground floor; icemen need climb no stairs to reach it. Receiving quarters for exhibit material are also on the ground level, simplifying the task of moving it into place. It is anticipated that, as in every previous year, the displays of materials and equipment by ice industry suppliers will be one of the most interesting and worthwhile phases of the 1951 convention.

Wilson Tells Business What It Needs

IN an appearance before the House Appropriations Committee in Washington recently, Defense Mobilization Charles E. Wilson was asked the question as to why unemployment is going up in "highly industrialized sections." His answer was significant, and we quote:

"I think it is time that the good old nutmeg makers got on their horses and went out and got some business. You have to work for it. Too many people wait for this to come to them on a silver platter. I have not seen that platter myself. You go get it, and you work intelligently at it and you may have to give considerable amount of help to the departments that are going to place it. This is the way you get it. It is not hard. It is there to get."

The fundamentals of good selling practices are just as important today as they ever were. The business is there, and it's not hard to get if it is gone after.

Colonial Ice Report

THE Colonial Ice Company, New York City, for the year ending May 31 reported net income of $82,948 or $4.48 a common share, compared with $154,926 or $9.23 a share the previous fiscal year.

Scott New Manager American Service

SUCCEEDING Lawrence M. Gibson, Ralph Scott has been named manager of the American Service Company's headquarters at Pittsburg, Kansas. Mr. Scott joined the Standard Ice & Fuel Co. in 1921. Then American Service bought the Standard and in 1944 Mr. Scott was transferred to Davenport, Iowa, to manage the company's plant there. In 1949 the Davenport plant was sold and Mr. Scott returned to Pittsburgh as assistant manager.

ICE FOR FRESH FRUIT COOLING

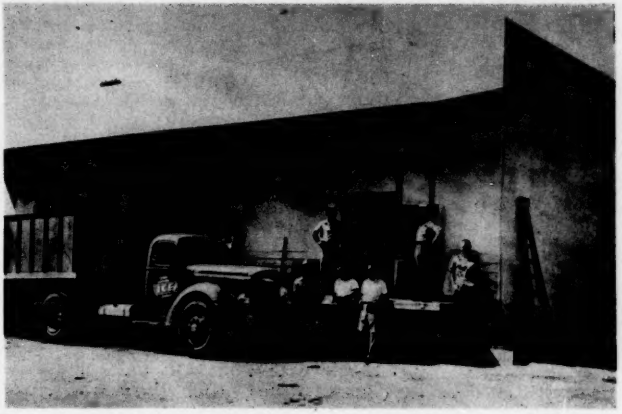
New cold storage plants for fresh fruit are established in California with block ice used as refrigerant. Both cost figures and humidity show favorable results

ANDERS J. HAUGE

LES ADKINS, manager of the Reedley Ice Co., gets around pretty well among the fruit and vegetable packers of the Reedley, California, district, and he never misses a chance to sell the merits of ice. One result is that during 1951 he has added two new cold storage plants to the list of customers served by his company, a subsidiary of the Central California Ice Co.

One of the new plants was built for the Royal Valley Fruit Growers Association, affiliated with the California Fruit Exchange. The other was built three miles west of Reedley for Frank J. Klassen at his packing house for the shipment of fresh table grapes.

Each cold storage plant holds about 30 carloads of fruit packed in lug boxes. The Royal Valley house measures 60 feet by 80 feet, Klassen's is 58 feet by 70 feet. Each contains three cold rooms and a hallway, which also can be cooled for storage. Klassen cut down the size of his hallway but his three rooms can hold as much fruit as



After the new cold storage plant of the Royal Valley Fruit Growers Association has been iced, officers and employees of the association and the Reedley Ice Company pause for a picture. The truck is from the Central California Ice Company which owns the Reedley firm.
—Photo by John Nurmi, Reedley

Frank J. Klassen shows a visitor (the writer) through his new cold storage plant. They stand in the hallway from which the two doors at left and the one at rear lead to the cold rooms, the door at right is the one through which fruit is loaded into railroad cars.—Photo by John Nurmi, Reedley.

Royal Valley grapes are stored in the new cold plant of the association. The men in the picture are: standing, left, Walter Rice, president of the Royal Valley Fruit Growers Association, and Blueford Wyckoff, floor man in its packing plant; front row, Les Adkins, manager of the Reedley Ice Co., Al Olsen, manager of the packing house, and Hiromi Shimizu, secretary of the association.
—Photo by John Nurmi

those of the larger Royal Valley house in town.

Cold storage with ice is not new to the fruit producing area of the San Joaquin Valley, in fact there has been enough experience with this type of house so that cost figures could be used as a convincer for ice cooling.

Cost Is Favorable

Klassen and the Royal Valley association were told that fruit can be cooled in a house such as they built at a cost of two to three cents a box, then held in storage at an additional cost of two to three cents a box per month. Klassen compared this with the cost of cold storage he has paid on grapes the past few years — costs which ranged as high as nine cents for the first month and seven cents thereafter in commercial cold storage plants.

To the cost figures, Adkins has added the argument that the relative humidity of ice cooling holds the fruit in the best possible condition with no shriveling and loss of weight due to drying-out.

Both the new plants were built generally on the design of one erected in 1950 for Kennedy-Stewart Co., Reedley packers for the Nash De Camp company. They are of wood frame construction with stucco exterior finish and redwood bark for insulation. Associated Refrigeration Engineers of Los Angeles built both.

In a typical plant, the ice bunkers are set low and all on one side so they can be filled from trucks which drive up beside the building. Inside, there are large fans which draw the air from the fruit rooms down and over the ice which takes up the heat the air has absorbed from the fruit. The cooled air then is forced up and out into the cold rooms at the top, circulating down through the stored fruit and out at the bottom to flow over the ice again.

The Royal Valley house was used during the plum and peach packing seasons to precool fruit before it was placed in refrigerated railroad cars or trucks. It will be used later for overwinter storage of Emperor grapes.

Mr. Klassen packs only grapes, plans to use his cold plant to hold Thompson Seedless grapes for a few weeks this fall, then will empty it and fill the rooms with Emperors for winter shipment.

The two new plants double the storage capacity of this one central San Joaquin Valley shipping center for deciduous fruits and grapes.

U.S. Court of Appeals Sustains Opinion Holding Sized Ice Patent Invalid

THE United States Circuit Court of Appeals for the Fourth Circuit on July 26, 1951, rendered a decision sustaining the opinion of the District Court invalidating all seven of the claims of the patent suit filed by Orrison et al vs. C. Hoffberger Company, Baltimore, Md. This suit was brought some months ago by Kelvin T. Orrison and others for alleged infringement of patent covering production of "sized" ice.

Prior Use Proven

The court's decision stated that prior use had been proven beyond any doubt and dismissed all other considerations presented by the defendant.

In its decision the court stated that "patent has not been put to commercial use by the owners, nor has any ice manufacturer accepted a license to practice it. In a suit in Texas, the patent was declared Void on all nine claims by reason of prior use and prior art. An appeal from this suit is pending."

The decision states further: "The defendant, a Maryland corporation engaged in the manufacture of ice, asserted defense of non-infringement, invalidity through anticipation by prior art, prior use and publication, indefiniteness of claim, laches and fraudulent conduct in securing the patent. The District Judge found no merit in the defense based on fraud, recognized the defendant's concession that if the patent is valid the defendant infringes, and determined that the patent was not anticipated by prior art patents or publications."

"However, relying chiefly on a prior use of the invention by the City Ice & Fuel Co. of Columbus, Ohio, he held the patent valid; and hence he found it unnecessary to go into the question of plaintiff's laches in bringing suit. This conclusion is abundantly supported by the evidence, and the prior use at Columbus constitutes so clear an anticipation of the patent, that in affirming the judgment, we find it unnecessary to consider any other defense."

The patent on which suit was filed covers nine claims of which five product claims and two process claims were attacked in the suit. One subject of the invention "it to provide a commercially feasible supply of crushed, graded ice in a readily available package form for dispensing by drug stores, ice cream parlors, hotels, restaurants and the like." Another object "is to produce as a new product, clean, free-flowing, sparkling, crystal-clear lumps of ice free from snow and preferably of predetermined graded sizes in a cheap and practical manner."

The court found that the evidence was not sufficient to show a reduction of the invention was practiced prior to January 31, 1938, the date on which the application was filed for the patent. Orrison claimed that the invention was conceived and put in practice in 1935 when he was employed by the Terminal Ice & Fuel Co., Washington, D. C. According to Jennings, a co-owner of the patent, he and Orrison were employed during the summer of 1935 to promote the sales of ice. They testified that a small machine for the manufacture of the patented product was made at Orrison's home and later set up in the company's plant. However the machine was not produced nor any drawings of it, and use of the machine at the company's plant was denied by other employees and representatives of the company.

The court further stated that it was not necessary to decide on this point and others since conclusive proof of but a single instance of prior use was sufficient to defeat the patent and prior use by the City Ice & Fuel Company, Columbus, Ohio, had been conclusively established.

Texas Suit Pending

An appeal of the Texas suit from a decision of the District Court which held all nine basic claims of the "patent" invalid is now pending in the Circuit Court of Appeals for the Fifth District.

Accordin to general opinion among members of the ice industry, this patent covering the sizing of ice probably has been made ineffective by this decision of the Federal Court of Appeals, although final conclusion cannot be made until after all court decisions have been rendered.

Timmons Defines Publicity

AN article by Francis X. Timmons in "Sparks" magazine published by the National Research Bureau presents practical information on newspaper and magazine publicity. Mr. Timmons who directs publicity for the National Association of Ice Industries defines publicity and tells how to work with editor and newspaper reporters in placing news releases and articles.

Canadian Ice Plant Modernizes – Sells Cubes Crushed Ice

Front view of Kitchener Tri-Pure Ice Plant. Note neat and spacious parking area newly asphalted.

ANOTHER milestone has been reached in the plant modernization and expansion program commenced in early 1950 by the Kitchener Tri-Pure Ice Company, owned and operated by the Blue Top Brewing Co., Ltd. Recently a new show room and office was opened.

A closeup exterior of vending service at Kitchener Tri-Pure Ice Company plant. A customer has purchased a bag of ice cubes.

A one-story structure, it commands a striking appearance with its outside trim of stainless steel. A canopy, of modern design, adds much to the smartness of the building, and above the canopy, over the entrance, 18-inch stainless steel block letters read "TRI-PURE ICE." Large floor-to-ceiling plate glass windows are at the front of the building, with half-floor-to-ceiling windows at the side, looking out to a spacious parking area, just recently asphalted, where customers drive in for ice. A terrazo floor, with recessed fluorescent lighting in an acoustic ceiling combine to make a very smart interior. In the rear of the office show room is a route salesmen's locker and meeting room, as well as a washroom with showers.

New Pulling Floor

With the construction in 1950 of a new pulling floor, raising the plant's production capacity from 45 tons per day up to 106 tons per day, the company was able this year to reduce by half its seasonal storage space, converting the greater portion to day storage and a smaller portion to a room for ice vending machines. These machines will dispense a 25 lb. block, a 50 lb. block, a bag of cubes or a bag of crushed ice, and probably offer the largest variety of ice products that is supplied by any ice distributor in Ontario.

More pictures from the Kitchener Tri-Pure Ice Company. Picture at left shows a closeup of the self-serv ice platform and vending machines. At right is shown samples of products obtainable from vending machines. This picture was made for use in the company's newspaper advertisements.

With excellent cooperation from the Bonar & Bemis Co., Burlington, Ontario, the company is able to offer, through one of the dispensers, a double wet-strength bag containing approximately 25 lbs. of crushed ice, for which the customer deposits a 25 cent piece. In the short time this package has been offered to the public, it has proven to be increasingly in demand, especially on week-ends.

Customers Like Crushed Ice

Customers headed for picnics buy a bag of crushed ice in preference to block ice, and this is but another indication that proper packaging and availability of this premium-priced product will create a demand for it by the buying public. A canopy, similar to that outside the office show room, is above the dispensing chutes, with stainless steel letters on it that read "SELF-SERV-ICE."

Sales of cubes and crushed ice through the vending machines have really amazed them, according to J. J. McGoey, manager. Both have been extremely popular with the general public, he says.

A room has been set aside in the plant for the sizing of ice, and a machine for cutting cubes has also been installed in this room. Deliveries of sized ice will be made in bushel bags, and the new bag mentioned above. A fast-speed Uline Scoring Machine has been installed with chain conveyor attached.

Situated on the main east-to-west thoroughfare in Kitchener, King St., this ultra-modern ice plant receives excellent patronage from local and transient motorists.

Offering to the public a courteous home delivery, 24-hour Self-Serv-Ice, and modern refrigerators, this progressive company is taking every step possible for the continued growth and progress of the ice industry, and is demonstrating in a practical way its confident belief in the future of the industry.

Missouri Valley Fall Meeting

THE fall meeting of the Missouri Valley Ice Manufacturers Association will be held Tuesday, October 9, 1951 from 9:30 a.m. to 4:00 p.m. at the Missouri Hotel in Jefferson City, Mo. An interesting program has been planned covering discussions of merchandising, OPS regulations, vending stations and other subjects of current interest.

American Ice Dividend

A dividend of $1.50 on the $6 noncumulative preferred, payable September 28 to stock of record September 14 has been ordered by the American Ice Company. A similar amount was paid in July. Last year it paid $1.50 each in July and September and $3 in December.

New Dairy Plant at Niagara Falls Is Completely Equipped With Modern Refrigeration Equipment

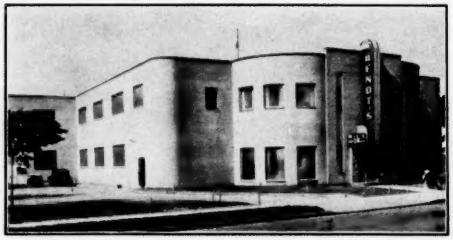
TWENTY-FIVE years ago Edwin J. Wendt started in the milk business at Niagara Falls, N. Y. with one route and one small Frick refrigerating machine. This machine, a 5 by 5 open type, was purchased from Mollenberg-Betz Machine Company of Buffalo. In succeeding years the business grew rapidly. A 4 by 4 combined ammonia unit was purchased in 1926, another in 1929, and a 6 by 6 in 1931. In 1943 a 5 by 5 was added, in 1947 an 8¾ by 6 booster, and in 1948 another 6 by 6.

Wendt's Cream Top Dairy recently opened a new plant which is one of the finest of its kind in existence. This is built of cream-colored glazed brick, has two floors with a total area of 38,000 square feet, and has modern equipment throughout. Interior walls are faced with a buff two-tone ceramic tile. The architecture is both striking and pleasing. The curved front contains a dairy bar seating 75 people at a time, on the first floor, and offices on the second; both levels are air conditioned with water cooled by the Frick machines.

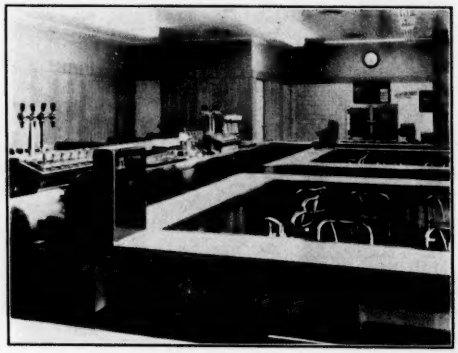
The big new plant, which cost approximately $600,000, now serves 18 milk routes, has a capacity for making 1500 gallons of ice cream per day, and enjoys an extensive trade through its local sales room.

Refrigerating Equipment

The refrigerating equipment now includes three 6 by 6 Frick compressors, a 5 by 5, a 4 by 4 and an 8¾ by 6 booster. Two 60-ton evaporator condensers are installed on the roof. One of the 6 by 6 machines is connected to a sweet water cooler of the Instant type, and a 5 by 5 to a similar but smaller cooler. Five suction lines handle the loads from the high temperature milk cooler, the direct-expansion ice cream freezers, the hardening rooms, the water coolers, and a shell-and-tube cooler for the water used in air conditioning the plant.



Above: New plant of Wendt's Cream Top Dairy at Niagara Falls, N. Y.



Right: This modernistic ice cream bar in Wendt's seats 75 people.

Ice Releases Produce Good Publicity

DURING June, July and early August a record total of ice publicity releases has been circulated from the National Association of Ice Industries to press, radio and television outlets throughout the 48 states. Results have been excellent.

Concentrating to hit the hot season hard, 19 separate releases have gone out in this period promoting ice and ice-using appliances. Among the subjects covered have been picnic chests, freezer ice cream, ice punch bowls, ice for summer beverages, glamour-icing and iced produce. Tying in with the national consumer advertising campaign, party ice has been mentioned in almost every release. To give the release "straight" news value whenever possible, some bit of practical information such as a recipe has usually been included along with the ice "sales talk."

The mailing list is made up of newspaper women's editors in the larger cities, women radio and television commentators, and women's editors on weekly newspapers in the smaller towns. This gives thorough coverage of the reading and listening public, especially when combined with similar ice publicity in national magazines.

Press Publicity

These are only a few typical instances of recent ice publicity in the press:

The American Weekly Sunday magazine section, nationally circulated, had several freezer ice cream recipes in its "Household Almanac" feature on July 1.

Freezer ice cream was also written up during July in the Boston Post, the Arkansas Democrat, The Washington Post, and the Albemarle (N.C.) News and Press.

Directions for making an ice punch bowl were given in the Washington Times-Herald on July 1, and in the St. Louis Globe-Democrat on June 13.

And in a story on iced tea, the food editor of the Brooklyn Eagle wrote that "iceman's ice helps to keep good flavor since it melts more slowly and therefore does not dilute the brew so quickly. It is no longer necessary to chip pieces from a large block of ice with an ice pick. Most ice companies supply cubes at reasonable cost."

Headlining the ice publicity for August is a three-page article in one of America's foremost business magazines, Nation's Business. Titled "Manufactured Ice," the writeup is one in a monthly series of stories on how various industries originated. The article was prepared by free-lance writer Harold Helfer from material supplied by the National Ice Association's Public Relations Department. Helfer, it may be remembered, wrote a similar story last year for the Sunday Magazine Section of The Philadelphia Inquirer.

Though devoted mainly to an account of Dr. Gorrie's invention of the ice machine, the Nation's Business article includes much commendatory mention of today's ice service. For example:

"Without artificially created ice, the fish industry would be confined to a few coastal towns instead of being a nationwide 1,000,000 pounds-a-year business. Nor would fresh vegetables and fruit be available in such a variety so frequently to so many people—98 percent of the perishable produce in this country is brought to the ultimate consumer under ice . . . And, far from being on its way out because of mechanical refrigeration, ice, which has the virtue of humidifying while it cools, a necessary quality to preserve many foods, is being produced on twice as big a scale today as it was 25 years ago when mechanical refrigeration first began to catch on."

Nation's Business is the official magazine of the U. S. Chamber of Commerce. With a circulation of 735,241, it reaches a high-level representation of businessmen and women throughout the country. This article easily rates as a top publicity achievement for 1951.

Corn Icing Covered On Radio Newscast

EXPERIMENTS on the improvement of corn via field icing were reported on a 9 a.m. newscast over CBS radio network on July 17. As one of his items, Newscaster Don Hollenbeck broadcast this recorded story from correspondent Harry Martin in Indianapolis:

"Today's budget-worried housewife has many reasons for being the unhappy soul that she is. The high cost of living puts her food budget in a squeeze. She thinks fondly of the days when her family could bite into a T-bone steak, then she comes home with a pork roast and hears the man on the radio saying that beef is so high-priced because of the housewife's increased purchasing power.

Housewife Gets Break

"Now, at last, the housewife gets a break, more flavor, more quality for her money; roasting ears that taste the way they used to back on the farm. Too often corn on the cob purchased at the food markets is a rather dull tasting product, and all the butter you can smear on won't bring back the country flavor. Well, now the flavor is there, preserved by field icing, which incidentally has no connection with the icing or frosting of a cake. Field icing is a quick-cooling process for the corn by a bath of ice water and a covering of artificial snow.

"Much of the sweet corn on the market today is iced in the field just a few minutes after it's picked from the stalk. Experimenters have found that sweet corn loses more than 90 percent of its sugar in six hours of hot summertime field temperatures. It seems the enzymes in the corn work fast in hot weather, changing the sugar to starch and robbing the roasting ears of their flavor. Icing in the field, in packing sheds or wagons outsmarts the enzymes, and enables the grower to save 80 percent of the sugar in the corn, to save it for the housewife.

Third Year of New Field Icing Method

This is the third year of the new field icing method here, an idea borrowed from the California peach growers. They field-ice their products for another purpose; to control brown rot. It's working out wonderfully well. Many of the commercial growers near the large cities have adopted it, but the proof of the pudding, or of the field-icing of sweet corn, is in the acceptance by the housewife. Last summer, Purdue University researchers conducted a post-card survey of housewives who purchased the field-iced corn. Results are just now being tabulated, and they show an overwhelming vote in favor of the flavor of sweet corn iced in the field."

The story apparently was obtained directly from Purdue University, where a two-year study of corn hydrocooling and layer icing sponsored by the National Association of Ice Industries is at present being completed.

Reports from Unit Ice Associations

Indiana Association of Ice Industries

ROBERT W. WALTON, Secretary

THE 1951 ice season in Indiana is fast becoming history, and though we have experienced brief periods of typical summer temperatures, the 1951 season cannot be generally accepted as one completely favorable to the ice business. Reports to this office indicate improvements over 1950 volume in some cases, but in general our tonnage was again below the previous year.

While it is always difficult to ascertain the inroads made by mechanical competition, it is evident that this unfavorable tonnage trend is in some measure due to mechanical competition losses. However, it is our conviction that this trend can be checked and started in the plus direction by renewed vigor on the part of the industry in developing new markets for ice.

We are already seeing a favorable increase in the vegetable icing business through the increasing interest of chain stores in the icing methods of displays. Swift and Company has proved a wonderful ally in their broiler promotion campaign, research projects fostered by the National Association are beginning to bear fruit, and there will be stories of amazing strides in new market development in the near future.

These markets cannot be promoted and developed in an industry that is not unified. It is essential that ice men get behind their industry organizations and help in the common effort to promote the still great ice industry.

Although the Indiana annual convention does not convene until March 31, 1952, we feel that it is not too early to bring this important event to attention of members. We will return to French Lick Springs in 1952, through popular demand. A vote of the members at the closing session of the 1951 convention was preponderantly in favor of French Lick for 1952.

Approximately 10,000 visitors were present at the annual conference held by Purdue University July 31 through August 2. Prominent in the exhibits and demonstrations were iced poultry, red meat and fruit and vegetable displays. Iced meat and fruit and vegetable display cases were provided by R. F. Ramsey of the Lafayette Ice & Coal Company and poultry display cases were provided by the Indiana Association of Ice Industries.

Florida Ice Association

THE 26th annual convention of the Florida Ice Association will be held at the Sheraton Plaza Hotel, Daytona Beach, October 14-16. The convention will be opened with a welcome party Sunday evening.

At the first convention session Monday morning, George Warren, general sales manager for City Products Corp., Chicago, will discuss the latest methods of selling ice-using appliances. C. M. Gay, Florida State Comptroller will talk on Florida finances. Other speakers will add up to a highly interesting program.

Entertainment for the ladies will include a sight-seeing trip of Daytona Beach and a luncheon at the Palmetto Women's Club. The outstanding social event will be the president's buffet dinner and dance Tuesday evening, October 15.

Northwest Association Of Ice Industries

L. F. MARSH, Secretary

THE third annual fall conference of the Northwest Association of Ice Industries will be held Friday, October 19 at Gaffney's Lake Wilderness. Those who attended the conference last year at this beautiful spot will remember it with pleasure.

These Northwest conferences are events that no Northwest ice man can afford to miss. The questions that come up for discussion, the telling of how problems have been solved, the discussion of how costs have been reduced, better and less expensive ways of doing things, are all full of practical information that bring a cash return. The social side also is a very attractive part.

Ohio Association Booth at State Fair

THE Ohio Association of Ice Industries presented its usual ice display in a booth at the Ohio State Fair which was held in Columbus, August 24-31. The exhibit was built around sweet corn icing as a central theme. This fitted in with the research program that has been carried on in Ohio during the summer. The picture in the background were actual photographs which told the story of corn icing step by step from the field where it was grown through the point of icing and ready for the market. There was an exceptionally large number of visitors in the booth this year and both corn and produce men were very receptive to the corn icing program.

Picnic chests were also on display in the booth and judging from the number of inquiries concerning them, they created a great deal of interest. A leaflet giving a resume of the corn marketing study at Ohio State University was passed out to visitors. Wm. R. Cunningham of the City Products Corporation, Columbus, and a member of both the research and merchandising committees of the Ohio Association had charge of the exhibit.

Front View of Ohio Association State Fair Booth.

Refrigerated Warehousing Industry

NATIONAL ASSOCIATION of REFRIGERATED WAREHOUSES

Division of American Warehousemen's Association

Executive Offices
TOWER BUILDING, WASHINGTON 5, D. C.

Executive Vice-president
WM. DALTON, WASHINGTON, D. C.

Secretary
JOS. H. COLQUITT, WASHINGTON, D. C.

President
J. P. JOHNSON, WASHINGTON, D. C.

Vice-president
A. B. EFROYMSON, CLEVELAND, OHIO

Treasurer
C. E. SIMMON, OKLAHOMA CITY, OKLA.

THIS MONTH IN BRIEF

Leading refrigerated warehousemen and one frozen food packer comment on Harold Emerson's article in the August issue on "What's Wrong with the Warehousing Business." Most of them agree with Mr. Emerson and some additional thoughts are offered.

A brief on the National tax bill has been submitted to members of Congress by Jerry P. Johnson, president of the National Association of Refrigerated Warehouses. It calls for elimination of preferential tax treatment for individuals or groups; strict economy in government non-defense spending, and adoption of a pay-as-we-go program.

Members of standing committees for the National Association of Refrigerated Warehouses have been appointed by President Jerry P. Johnson, with a statement of the purposes and functions of each committee.

Cold storage holdings for August 31 showed a slight increase for both cooler and freezer space.

Warehousemen Respond

Leading refrigerated warehousemen and frozen food packers tell what they think is "wrong with the warehousing business."

"WHAT'S Wrong with the Warehousing Business," was discussed in an article in the August issue of ICE AND REFRIGERATION by Harold C. Emerson, vice-president and general manager of the Cumberland Warehouse Corp., Bridgeton, N. J. Mr. Emerson listed some of the inadequate, as well as some of the satisfactory refrigerated warehousing services as they are performed now. For a complete resume of what he wrote, see the "box" in the center of this page for the high points extracted from his article.

This article prompted a flood of letters from interested warehouse operators and frozen food packers. For further contribution of thoughts on this subject, the more interesting letters are as follows:

Keep Eager for Business

I THINK Mr. Emerson has made some very timely observations in his recent article. Any efficient warehouseman should always conduct his customer relationships as though he were about 50 percent full and mighty eager for business. The frozen food business, that section of our business to which Harold refers, is largely conducted with national or regional concerns, meaning more business by mail and a greater need of prompt notices of all kinds.

It is incumbent upon our industry to realize that when we warehouse stocks for a national concern we are simply a department of our customer's business. If a department of a large business runs inefficiently, the department manager or foreman is warned and then fired. Our relationship is not a great deal different. There must be a fast and dependable flow of information from department (and that means warehouse) to head or branch office. It must be set up as a routine.

Our industry can never be smug. The application of the golden rule in our industry is almost mandatory.

HARLAN J. NISSEN,
Terminal Refrigerating Co.,
Los Angeles, Calif.

Needs Sales Policy

HAROLD EMERSON'S article is perfectly sound. We, of course, all know that the operating conditions in different cities or different plants are not identical, but by-and-large his admonishments are in order.

In my thirty-eight years of experience in the cold storage field I concluded long ago that what the cold storage industry needed most was some type of sales policy, even though we acknowledge we have nothing to sell except service. I have found that the best way to accomplish this when hiring new men is to take on those who have at least a reasonably young experience in the sales field. Such men usually appreciate the need for proper contacts with our customers and the necessity of always keeping in contact with them, and the need for immediate straightening out of any difficulties or errors which are bound to occur from time to time in all plants.

HENRY C. KUEHN
Wisconsin Cold Storage Co.
Milwaukee, Wis.

A Look at Ourselves

I HAVE read with a great deal of interest Harold Emerson's article published in the August issue of ICE AND REFRIGERATION.

I suspect that Mr. Emerson, in his criticism of refrigerated warehousing, is being kind and cautious to the industry as a whole. We need to take a good look at ourselves once in a while, and Harold's article has afforded us an opportunity to do just that. He has done the industry a great favor.

GARTH A. SHOEMAKER
Hygeia Refrigerating Company
Elmira, New York

Customers Have Quirks

THE following remarks about Mr. Emerson's article, it should be understood, comes from one who does not consider himself an expert warehouseman, but just one who watches his business and does the "best he can, from day to day."

It is inconceivable that any warehouse would fail to send out its withdrawal tickets on the day the withdrawal is made.

It is true that some customers require withdrawal notices sent to as many as four different places. It is true that some customers require special forms. These inequities generally right themselves. If they do not, then reasonable explanations always bring results with most people. In that respect we, too, realize our obligation.

It could be that Mr. H. C. Emerson knows things that cause him to have much less respect for the cold storage warehousing business than the writer has.

HENRY J. C. BRENNER
The Terminal Cold Storage & Ice Co., Dayton, Ohio

(Note: The following letter was written direct to Mr. Emerson and reprinted here with the writer's permission.)

Customers' Demands A Big Consideration

I HAVE just read with much interest your article in the August issue of ICE AND REFRIGERATION under the caption, "What's Wrong with the Warehousing Business?" The article is well phrased, but I think the title is misleading. I don't think it's a case of "What's Wrong with the Warehousing Business?" but "What's Wrong with the Warehousemen?" It is the warehouseman who is responsible for any unsatisfactory conditions involved in the handling of his customer's business.

While there is laxity at times on the part of the warehouseman, I know you will agree that there is also at times something to be said on the other side of the picture, because customers do make demands that create serious difficulties for the warehouseman. They apparently overlook the fact that in addition to their business, the warehouseman has the business of many other customers, and unfortunately, due to the seasonal character of the refrigerated warehousing business, many customers require service at or about the same time. Not infrequently customers display the very unreasonable attitude that their business should come first, regardless of the other fellow. Also, there has been a tendency on the part of some storers to demand that the warehouseman perform a large amount of accounting detail, adding materially to the burden of the warehousemen and at the same time relieving the customer's own accounting load.

Any warehouseman who in any way fails "to exercise such care . . . as a reasonably careful owner of similar goods would exercise," is sooner or later going to find himself in serious difficulties. As the custodian of highly perishable products, which must be handled in a way that will protect their quality and condition, he is dutybound to constantly have his great responsibility in mind—not only his legal responsibility, but his moral responsibility. The future of his own business depends to a large extent upon his doing his job right.

On the other side of the picture, the storer also has a responsibility to the warehouseman. When a warehouseman goes all out to handle a customer's business in the best possible manner and tries to meet his detailed requirements in every way possible, it is pretty discouraging to suddenly find that, because of a penny or two difference in rate or some other special inducement, the customer has placed his business elsewhere. This sort of treatment makes the warehouseman question whether his all-out efforts to do the best possible job to please the customer are justified.

In refrigerated warehousing, as in all lines of business, there must be give and take and a real spirit of cooperation if confidence and good feeling are to prevail. No business can be successful over the long run on any other basis.

Again, your article is excellent and it is timely, and if any of our fellow warehousemen are not discharging their responsibilities as they should, perhaps it will stimulate them to do so.

J. R. SHOEMAKER
Hygeia Refrigerating Co.
Elmira, New York

Do's and Don'ts for Good Warehousing

(High lights of article by Harold E. Emerson in August issue of ICE AND REFRIGERATION.)

Do

Give the customer the service he asks for—and do it with a smile. If it is going to cost you more money to do it his way, tell him so, explain why and he will agree to pay you accordingly.

Walk your receiving and shipping platforms once in a while. Get to know how your people talk to and take care of your customer's representatives. Get to know the representatives yourself. Sometimes they can give you tips on how to improve service that will be helpful from your angle as well as theirs.

Heed the bulletins sent out by the National Association of Refrigerated Warehouses and the Refrigeration Research Foundation. The Staffs of these two organizations are working continually for you. Their bulletins contain practical information gathered from all over the United States giving you up to the minute news on every phase of refrigerated warehousing; including building, operation, maintenance, public relations, and governmental regulations.

Don't

Try to argue a customer out of what he asks for just because it may change your routine. Adjust to fit his needs.

Try to sidestep or gloss over an error or omission. Be the first to admit it and get the jump ahead of any complaint.

Neglect to tell your employees that your customers' business is their bread and butter as well as yours. Hence the work which has to be done for customers should be welcomed and done willingly. If you didn't have any customers—there wouldn't be any work—or any pay checks either.

Frozen Food Packer Wants More Uniform Rate Basis

REFERRING to Mr. H. C. Emerson's article in the August issue of ICE AND REFRIGERATION, it seems to me that Mr. Emerson and his company are in exactly the same position as our company and our operations would seem to parallel his one hundred percent. In other words, we both have the same problems and hopes. To comment on his article is to agree wholeheartedly with each and every statement.

Great emphasis can always be placed on the written forms peculiar to the cold storage warehousing industry. All a frozen food packer sees to tell him that his merchandise, worth thousands of dollars, has been received or delivered, hundreds or thousands of miles away, is a warehouse receipt or a delivery ticket. It is inconceivable to me that there are warehouses who will issue a warehouse receipt, a legal document representing great amounts of money, written in pencil and sometimes hardly legible. Warehouse receipts are often lacking in descriptive information; delivery tickets are frequently slow in arriving and partly or wholly illegible.

It has been my hope for some time that the N.A.R.W. will establish a policy whereby all its members will agree to charge for storage on a net or gross weight basis. It is difficult for warehouse customers to compare rates, pay storage charges, figure costs, etc. when some warehouses charge for storage on net weight, others on gross weight and yet others on some weight in between net and gross. A nationally consistent system of charging for withdrawals, for vari-

ous sized merchandise and total weight in a lot would also be most helpful.

In line with Mr. Emerson's thinking, we who are making "Dulany—the finest name in frozen foods" can readily appreciate a warehouseman taking the time and initiative to do more than "handle the product as though it was his own." We want and expect the storing of our frozen foods to be mutually satisfactory and mutually profitable.

Personally, I feel that Mr. Emerson's article is a step toward better understanding between cold storage warehouses and their customers. We must remember that frozen food processing and storing is a relatively new field and has yet a greater future.

H. G. HAYMAN
John H. Dulany & Son, Inc.
Fruitland, Md.

Uniform Reporting Would Reduce Costs

I WAS very much interested in reading Harold Emerson's article in ICE AND REFRIGERATION. I believe our folks are complying with all of Harold's recommendations, with the possible exception of notifying shippers when cancellations are received. We receive so few cancellations that it has never occurred to us that we should do this.

I'm particularly glad that Harold stressed uniform reporting. Our companies are very much concerned with the increased cost of clerical work and it does seem that some standard form could be worked up which would save considerable warehouse clerical time and thus save customers a certain amount of expense. Now that most firms are using some form of duplicating office machines, it would be helpful if combined customer-warehouse forms could be used and if the customer could fill these out and provide the warehouse with the necessary number of copies, both for receipts and deliveries.

HORACE W. WILSON
Quaker City Cold Storage Co., Inc.
Philadelphia, Pa.

Refrigeration Problems for Vegetable Growers

REFRIGERATION problems in handling Florida's vegetable crops will be discussed by Dr. F. S. Jamison, University of Florida vegetable crop specialist, at the 26th annual convention of the Florida Ice Association October 14-16 in Daytona Beach.

The experiment station horticulturist's talk before the ice association members will cover processing and marketing of Florida's sweet corn from the time it is harvested until it reaches the hands of the consumers.

Government Announces Dried Whole Eggs for Sale

DRIED whole eggs and other commodities held by the Commodity Credit Corp. were announced for sale during September. Publication of the list of such commodities was designed to aid in moving CCC's excess inventories into export through regular commercial channels. During the period January 1 through August 17, 1951, sales of dried whole eggs from the export list totaled 1,726,874 pounds, valued at $557,440.

Stocks of CCC-owned dried whole eggs as of August 31, 1951, were in storage at the following warehouses:

Fulton Market Cold Storage Co., Chicago, Ill.
North American Cold Storage, East St. Louis, Ill.
Indiana Terminal Refrigerating Co., Indianapolis, Ind.
Hubbard Ice & Fuel Co., Cedar Rapids, Iowa.
House of David Cold Storage, Benton Harbor, Mich.
General Cold Storage Co., Detroit, Mich.
Grand Trunk Warehouse Co., Detroit, Mich.
Detroit Harbor Terminal, Inc., Detroit, Mich.
Detroit Refrigerating Warehouse Co., Detroit, Mich.
Michigan Refrigerated Warehouse Co., Lansing, Mich.
West Michigan Dock & Market Co., Muskegon, Mich.
Cincinnati Terminal Warehouse, Cincinnati, Ohio.
Distribution Terminal Warehouse, Cleveland, Ohio.
Federal Cold Storage Company, Cleveland, Ohio.
National Terminal Corporation, Cleveland, Ohio.
Sheriff Street Market Storage, Cleveland, Ohio.
Arctic Foods Storage, Inc., Martins Ferry, Ohio.
Great Lakes Terminal Warehouse, Toledo, Ohio.
Federal Cold Storage Co., Kansas City Kans.
Mutual Ice & Cold Storage Company, Topeka, Kans.
Railroad Ice Company, Topeka, Kans.
Empire Storage & Ice Company, Kansas City, Mo.
U. S. Cold Storage Co., Kansas City, Mo.
Artesian Ice and Cold Storage Co., St. Joseph, Mo.
Merchants Refrigerating Company, St. Louis, Mo.
Fairmont Foods Company, Crete, Nebr.
York Cold Storage Co., York, Nebr.
Duluth Terminal & Cold Storage, Duluth, Minn.
Northern Cold Storage Co., Duluth, Minn.
Merchants Cold Storage Co., Minneapolis, Minn.
Fairmont Foods Company, Moorhead, Minn.
Central Warehouse Co., St. Paul, Minn.
Milwaukee Cold Storage, Milwaukee, Wis.
Southwest Ice Dairy, Enid, Okla.

Refrigerated Warehousing

Shawnee Warehouse & Cold Storage, Shawnee, Okla.
Tulsa Cold Storage Co., Tulsa, Okla.
Texas Ice & Refrigerating Co., Fort Worth, Tex.
Merchants Refrigerating Co., Buffalo, New York.
Holley Cold Storage Co., Holley, New York.
Lyndonville Ice & Cold Storage Co., Lyndonville, N. Y.
Ransomville Chem. Storage Co., Ransomville, N. Y.
Diamond Cold Storage Co., Wilmington, Delaware.

Warehousemen Announce Annual Convention

OFFICIAL announcement has been issued that the 61st annual convention of the National Association of Refrigerated Warehousemen and of the American Warehousemen's Association will be held May 5-8, 1952 at the Roosevelt and St. Charles Hotels, New Orleans, La. The Roosevelt has been designated as the convention hotel. A New Orleans Housing Committee has been established and will handle reservations on a first-come, first-served basis.

Those who attend this convention are promised a good, interesting program and plenty of relaxation. The local Entertainment Committee say they have scheduled something new and different and that details will be coming along later.

No hotel reservations will be made until after January 1 at which time the official call will reach all A.W.A. members at the same time.

Press Releases Keep Food Industries Informed

ONE of the constructive activities of the National Association of Refrigerated Warehouses is its program of issuing press releases to over 40 newspapers and magazines serving the perishable food field. This supplies a valuable service in keeping customer and supplier industries advised of what the refrigerated warehousing industry is doing.

These releases go out regularly and are carried by a very large percentage of the trade periodicals. In addition to the trade publications, general circulation papers in various cities are contacted whenever there is industry news of a sort which would be of interest to them. It's good business to let people know what members of the industry are doing and that's why N.A.R.W.'s efforts in this direction are very valuable and important to all warehousemen.

Cold Storage and Fisheries Form Natural Business Partnership – Each Needs the Other

JAMES J. GALLERY
Chairman Committee on Warehouse Operations
National Association of Refrigerated Warehouses

INSTEAD of consuming fish and shellfish at the rate of almost two billion pounds a year—as they do today—the American people would be forced to eliminate virtually all of this vital food from their diet if it weren't for modern cold storage techniques.

It's a far cry from the damp, musty run-down buildings, once used for storage, to the public refrigerated warehouse of today. The modern cold storage plant is a specially built steel and concrete structure designed for efficient, scientific storage of vast quantities of perishable commodities. Today's cold storage warehouse is an arsenal of science, dedicated to the preservation of the fresh flavor, texture, color and nutritional value of perishable foods of all types.

A substantial portion of the six billion pound capacity of the nation's refrigerated warehouses is set aside for storage of the many varieties of fish and shellfish which the American consumer buys.

Recent estimates indicate that a frozen food boom is in the offing. By 1957 frozen foods—including fish and other seafoods—will be a $25 billion industry according to current forecasts.

The tremendous growth in the production of frozen fish and shellfish has forced a rapid and substantial growth in the space devoted to the refrigerated storage of seafood.

Large specialty markets, such as that for shrimp for example, would disappear if it weren't for the expert cold storage handling of such seafood as it comes from the water. The cold storage warehouseman, quick freezing the shrimp as it leaves the boat, makes it possible for the consumer to enjoy these marine tidbits at the peak of their appetizing goodness.

In the matter of distribution refrigerated warehouses are a mainspring in the works of the system behind the sale of fish products throughout the United States. Technical developments in the industry guarantee uniform quality and fresh product flavor—the result of much time spent in research in the handling of seafoods.

Scientific study of all aspects of the refrigeration problem is a bulwark against faulty handling. The Refrigeration Research Foundation, sponsored by the nation's cold storage operators, constantly signals the industry on food storage trends and new technical developments. Individual operators are thereby able to meet the special handling requirements of such storers as the fishing industry. Advance knowledge of quick freezing techniques, new products, new handling methods, new refrigerants, all help to keep the cold storage man a step ahead of the parade in doing a better job for the American fishermen and other cold storage customers.

Trained Engineers

A force of over 2200 trained refrigeration engineers devote time and skill to the never-ending battle for protection of perishable food supplies. No product handled by cold storage operators has required more careful study and expert warehousing than those of the fishing industry.

Quick freezing and car icing facilities are two of the special services developed by warehousemen to aid the fishing industry in properly handling its products.

Cold storage men are meeting the challenge of theg rowing commercial fishing industry. Public refrigerated warehousing space currently totals over 413,600,000 cubic feet. This vast storehouse capacity is being increased at an estimated rate of five million cubic feet a year. A substantial portion of the new facilities are devoted to the handling of frozen products including fish and other seafoods.

Warehousemen recognize that the cost of doing business is up, in the fishing industry as in all other businesses. They realize that profit margins have been shaved accordingly. To meet the situation they are taking steps to increase the efficiency of the refrigerated warehousing process in order to pass along to the storer every possible saving in rates. Mechanization of handling methods is one big step being taken in this direction. More and more warehousemen are adding to their mechanical handling facilities. At present 46 percent of the industry's plants are mechanized to some extent. Twenty-two percent are 75 percent mechanized. Ten percent are mechanized 100 percent. And the parade of progress continues with installation of more power conveyors, portable elevators, power transporters and other types of modern handling equipment.

Service Standards

Service standards, too, are coming in for more attention. The public relations-conscious warehousing industry is determined that such valuable customers as commercial fisheries will find it ever easier and more satisfying to do business via the public cold storage warehouse.

The future of the fishing industry depends very largely upon the performance of the refrigerated warehouseman as a vital link in the chain between producer and consumer. Warehousemen realize this and have left no stone unturned to guarantee that operational problems will not hamper the growth of America's fishing industry.

Alert to the needs of all customers industries, warehousemen are adding freezer space to their facilities a step ahead of the actual requirement for increased capacity. It's cold storage industry policy to anticipate such problems before they arise.

Inter-industry cooperation is a byword with NARW. Cold storage men have long realized that cooperative effort with allied industries is one of the keys to better business.

Two Effective Allied Industry Groups

It is significant that two of the most effective allied-industry groups in Washington were jointly founded by the National Fisheries Institute and the National Association of Refrigerated Warehouses. Both of these cooperative efforts have been highly productive for both the fishing industry and refrigerated warehousemen, and further opportunities for such united action will be fully exploited.

(Continued on page 60)

Reprinted from Fishing Gazette, May 1951. Mr. Gallery is with the Quincy Market Cold Storage & Warehouse Company, Boston, Mass.

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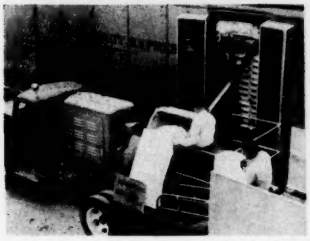

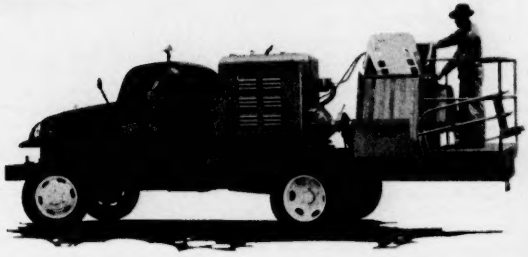

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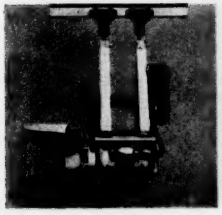

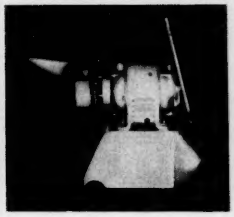

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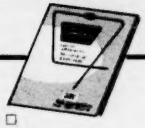

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Refrigerated Warehousemen File Brief on Federal Taxes —Ask Eliminatlon of Preferential Treatment

A BRIEF on Tax Bill H.R. 4473 has been submitted to members of the Senate Finance Committee and members of the House Ways and Means Committee. The brief, prepared by Jerry P. Johnson, president of the National Association of Refrigerated Warehouses was submitted in behalf of the association. It reads in part as follows:

In submitting this brief and in making our recommendations we are fully cognizant of the defense needs of our country and the absolute necessity for adequately financing them, but are somewhat puzzled over the attitude of the Administration and its supporters, of both political parties, in both the House of Representatives and the Senate, with respect to three basic precepts, which in the opinion of the members of our Association are essential to a sound tax program; namely:

1—No preferential tax treatment for any Individuals or Groups.

2.—Strict Economy in Government non-defense spending.

3.—Adoption of a pay-as-we-go program to eliminate deficit spending.

The following resume details the thoughts and opinions of our members and the refrigerated storage industry, representing more than 413 million cubic feet of public refrigerated space, charged nationally with the protection and distribution of the perishable food supply of the Nation —in other words—storage space for more than four billion pounds of perishable foods—the storehouse of the Nation. We are not big business as big business is generally known, but small business performing an exacting and essential service to the physical well-being of the American people.

Taxation of the Untaxed

Due to certain portions of the Internal Revenue code many organizations escape Federal income taxes, the sum total of which would make a very substantial annual contribution to the huge tax increases estimated as being essential for the proper defense of our Country. Certainly no business should be permitted to make a tax-free profit and especially not in time of war. All should share the burden. It has been conservatively estimated that the annual federal income tax escape—or evasion would probably be a stronger term—which Congress has tacitly permitted and authorized, would break down about as follows, according to the best estimates:

Cooperatives	$318,000,000
Mutual Banks	140,000,000
Building, Savings and Loan Associations	140,000,000
Mutual Fire and Casualty Insurance	33,036,000
Credit Unions and other mutuals	21,667,000

It must be quite obvious that fully taxed business cannot long survive in competition with these preferred and congressionally protected enterprises.

Growth of Cooperatives

The cooperative movement today goes far beyond the beginnings of farm cooperatives some 35 or 40 years ago. The tremendous growth of cooperatives marketing products under a statutory preference in tax-free competition with firms that were paying not only stiff corporation income taxes, but in many cases, during wartime, the additional excess profits tax, tells the story in few words. In 1942, at the start of World War II, cooperatives were doing about $5.5 billion gross business volume. Without this statutory preference they would have paid an estimated normal income tax of about $90 million, plus the excess profits tax of $45 million, or a total of $135 million. Now, the bulk of this $135 million during this period was added by the cooperatives to their capital for expansion. Their tax paying competitors did not have this advantage. By the end of the war, four years later they were doing over $10.5 billion gross business volume, or twice that of the war's beginning, with an estimated annual tax, which they escaped and competitive enterprise paid, of $263 million; or a grand total for the four years of $855 million.

It therefore must be conceded that the cooperatives profited and expanded enormously during World War II. In the years since the end of World War II, despite a slow-down from the war spurt, they have again nearly doubled their business volume. In 1948, the total was about $17 billion according to conservative estimates; and obviously they will again enjoy an increased tempo of business growth under the defense program, for which these taxes are asked.

This unfair advantage of the cooperatives over private enterprise, it is hard to believe, has the sanction and approval of the Congress of the United States. The cooperatives may have been intended to help farmers improve and stabilize their economic position, but certainly it was not intended that they should have a preferred tax status with distinct advantages over its competitors. If such is the intent it appears to be a tacit admission by Congress that American business should go cooperative or out of business.

It is not suggested that a tax should be levied on distributed earnings—the members pay income taxes on such earnings; but it has been conservatively estimated that some $300 million of new revenue could be produced by requiring Cooperatives to pay taxes on:

(a) Undistributed Earnings; and

(b) Allocated Earnings on which scrip is given their members.

With respect to the refrigerated storage industry a large number of cooperatives are competitive with our members and customers and we are vitally affected by their competition; but as citizens of this country we are equally concerned regarding other tax exempts, such as mutual banks; building, savings and loan associations; mutual fire and casualty insurance companies; credit unions, etc., and urge full equity in taxation by the removal of the present tax exemptions on all individuals or organizations, cooperative or otherwise, which are presently making a profit in competition with tax paying private enterprise.

Regarding business concerns organized and operated for the benefit of colleges or other tax-exempt institutions, the U. S. Tax Court commented in the C. F. Mueller company case—a macaroni manufacturer operated solely for the benefit of New York University, that since Mueller was making and selling macaroni in competition with others, the purposes of its operation could not be exclusively educational, and that exempting the company's income from tax:

"Could have a vicious effect upon nonexempt competitors, because the exempt corporation might be able to undersell its competitors and thus either drive them out of business or absorb them."

Other Tax Exempts

It is the opinion of this Association that the quoted portion of the Tax Court's comment is equally applicable to all other tax exempts. Bear in mind that prior to the taking over of the plant of the Mueller Company by the University their profits ranged from $600,000 to $800,000 annually. It is believed that fair and open minded representatives of the people in Congress must concur in this opinion.

While we, as refrigerated warehousemen, suffer competitively through the cooperatives, in confining ourselves to the problem of equitable taxation and the taxing of the untaxed, we feel that every business enterprise, no matter how or by whom owned, no matter what its alleged purpose, no matter what disingenuous statements are made in its charter or by-laws, no matter whether engaged in farm activities, selling, buying, storage, charities or used as a method of securing tax-free funds for

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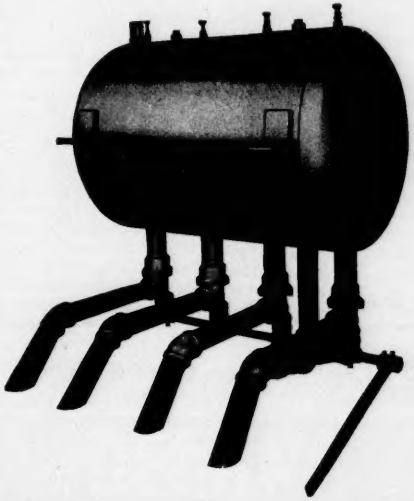

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a great university, should carry the same share of this tax burden. No one should be tax free.

Government Economy

Our Association has repeatedly urged economy in government spending. With the advent of the Korean difficulty and the necessity for financing the defense effort, we are more inclined than ever to stress the words of Thomas Jefferson—and one would think he was advising you gentlemen yourselves in respect to your present task:

"I place economy among the first and most important virtues, and public debt as the greatest of dangers. To preserve our independence, we must not let our rulers load us with perpetual debt. We must make our choice between economy and liberty, or profusion and servitude."

Now, if ever, is the time for government economy; to reduce government spending; to eliminate non-essential spending; and channel all of our resources to becoming strong; and not weaken our people and our country through excessive taxation. There is a vast difference between taxes assessed and paid to promote National Security in our conflict with Communism; and taxes assessed to further non-essential spending in furtherance of Government promotion of socialistic programs. There is grave danger, in the opinion of our membership, of overtaxation which may be the direct result of failure to prune this non-defense spending. Even defense spending itself needs close scrutiny.

If taxation becomes unduly burdensome and the worker becomes disinclined to merely swap dollars, we are apt to be faced with loss of incentive, loss of production, and consequent loss of tax revenue.

General Sales Tax or Manufacturer's Levy

Our members feel that a pay-as-you-go program is far more to be desired than the program of "Deficit Financing." If the Administration is sincerely in earnest about placing the defense program on a sound pay-as-you-go basis, it is their belief that they should support a realistic, complete, and sound tax program.

It is not believed that income and corporation taxes can stand the sharp increases necessary to accomplish such a program, without serious economic consequences, as such taxes, now bearing the full brunt of the tax program, are fast approaching the saturation point. This is quite forcefully illustrated when you consider the figures of the Treasury Department itself; namely:

(a) A one hundred percent tax on all incomes above $25,000 would only bring in $700 million.

(b) A one hundred per cent tax on all earnings over $6,000 (obviously impracticable) would only raise $6.4 billion.

(c) Corporate taxes now take slightly less than half of all industry's profits. Money for expansion (the apparent order of the day in the Defense Program) can only come from retained profits or new capital attracted by dividends; and the same dollars cannot be used for both expansion and taxes.

Therefore, a pay-as-you-go program, in the opinion of our membership, must include a general excise tax, or in other words, a federal sales tax, and they urge its adoption. With respect to the question as to whether such a tax should be at the manufacturer's or retail level, it is their opinion that to avoid burying the tax in the cost of the things the public buys and to prevent pyramiding the tax cost by each handler of the merchandise, that a general sales tax at the retail level, high enough to pay-as-we-go and balance the budget, after exempting food, clothing, medicine and shelter, the items forming the principal part of the budget of the low income family, should be adopted.

Therefore, we sum up our recommendations to the Finance Committee of the Senate, and to the Senate itself:

1—Full equity in taxation and removal of all tax preferential treatment for all individuals, organizations, cooperative or otherwise, presently making a profit in competition with tax paying private enterprise.

2—Complete elimination of non-essential spending by the Government.

3—Enactment of a National Sales Tax at the Retail Level, sufficient to insure a pay-as-we-go program.

Great Lakes Chapter To Meet in Chicago

A MEETING of the Great Lakes Chapter of the National Association of Refrigerated Warehouses will be held at the Edgewater Beach Hotel, Friday, October 12. There will be many interesting subjects on the agenda to be discussed. Those attending will, as always, receive valuable information as to what is going on in the industry generally, according to an announcement by Harry Foster, chairman of the chapter.

Date Production Storage

A CIRCULAR "Dates in Arizona" has been issued by the Arizona Agricultural Extension Service, University of Arizona, Tucson. This circular which would be of interest to those who handle dates is an illustrated discussion of all phases of production. Storage at 28 to 32 F is recommended for the early storage season with zero F for those carried through the spring and summer.

Chapter Meetings

THE following meetings of chapters of the National Association of Refrigerated Warehouses have been scheduled:

Missouri Valley, September 12, Omaha, Nebr. In charge, A. F. Versen, Secretary, St. Louis, Mo.; J. L. Gagini, Omaha.

North Atlantic, September 20-21, General Brock Hotel, Niagara Falls, Ont. Co-chairmen, Richard Doncaster, Holley, N. Y.; Joseph A. Whitmore, C.W.A., Toronto. This will be a joint meeting with the Canadian Warehousemens' Association and the New York State Association of Refrigerated Warehouses.

Great Lakes, October 12-14, Edgewater Beach, Chicago. In charge, Harry Foster, chairman, Cincinnati and William Ready, secretary, Indianapolis.

Southwestern, September 26, Texas Hotel, Fort Worth, Tex. In charge, C. P. Metcalf, chairman, Austin.

U. S. Cold Storage Building New Plant

THE U. S. Cold Storage Corporation has started initial construction on a two million dollar freezer plant in the meat packing district of South Omaha, Omaha, Nebr. The Defense Production Authority has awarded the company a $1,300,000 certificate of necessity for the plant which will have a freezing capacity of 300,000 pounds a day and a storage capacity of about 25 million pounds.

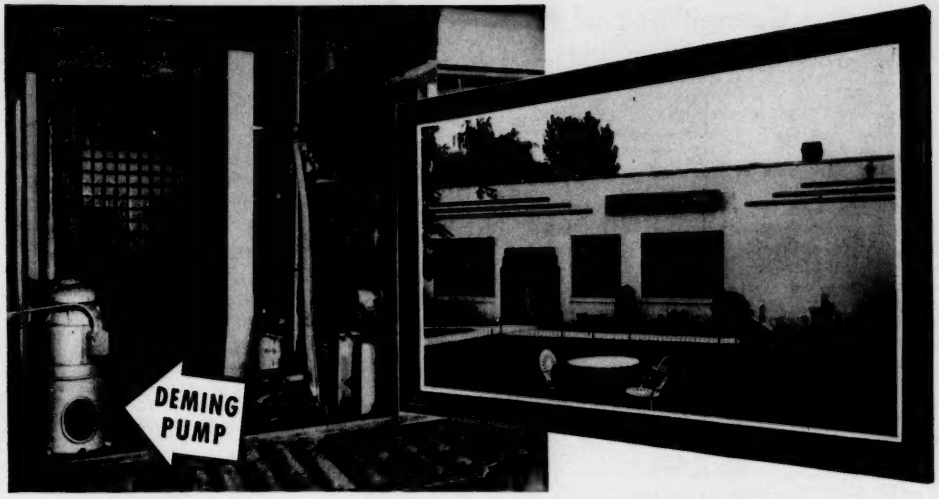
The one-story structure will be about 700 feet long and 220 feet wide and is expected to be in operation by next July. Carl E. Olson vice president of United States Warehouse Co., Detroit division of U. S. Cold Storage Corp., will manage the new plant.

Executive Committee Meeting in Chicago

THE fall meeting of the executive committee of the National Association of Refrigerated Warehouses will be held at the Drake Hotel, Chicago, Thursday and Friday, November 15 and 16. Agenda items are now being prepared and contributions are requested from any and all members.

Year Book Off the Press

BEATING last year's publication date by half a month or more, the 1951 edition of the A.W.A. Yearbook will be mailed to members soon. This latest chapter in the 60-year recorded history of A.W.A. will be interesting to every warehouseman.



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For 15 years, the Deming Turbine Pump has been in operation about 7 hours daily, 7 days a week.

In those 15 years, approximately 137,000,000 gallons of water were delivered by this unit rated at 60 G.P.M. with a 5 H.P. motor.

"So far, no repairs have been made," reported Mr. Brenner.

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IMPELLERS are bronze, semi-enclosed type, easily adjustable with adjusting nut located at top of motor.

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You can pump MORE for LESS

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Standing Committees of N. A. R. W. Are Announced – Personnel and Functions

MEMBERS of all standing committees of the National Association of Refrigerated Warehouses have been announced by President Jerry P. Johnson. Pointing out that grass roots committee activity is the principal source of unity and progress in trade association work, Mr. Johnson re-stated the purpose of each standing committee of N.A.R.W. He urged association members everywhere to contact committee personnel and through ideas and suggestions aid in formulating sound programs for industry action. Personnel and functions are as follows:

Committee on Banking

Chairman: Harlan J. Nissen, Los Angeles, Calif.; Ex. Com. Liaison: C. B. Hart, Tacoma, Wash.

Members: W. C. Baker, Chicago, Ill.; F. O. Cooke, San Francisco, Calif.; J. R. Goodfellow, Seattle, Wash; Hyland Hinman, Oakland, Calif.; W. A. Kopke, Chicago, Ill.; R. T. Mackenzie, Dallas, Texas; Allen Rushton, Birmingham, Ala.; Chas. M. Smith, San Antonio, Texas; H. A. Steinmeyer, St. Louis, Mo.; James W. Straub, New York, N. Y.; Leo D. Tyrrell, Camden, N. J.

Banking and its relation to the cold storage industry requires no explanation of its importance. The booklet on Warehouse Receipts prepared by the Committee on Banking Relations of the American Warehousemen's Association is indicative of the work which can be accomplished by a working committee.

Detail work of this committee must and should be performed by the National Office, but the energy and interest expended, the ideas and plans, etc., must emanate from the committee members. Without their interest and enthusiasm it will be valueless. The duties of the committee are:

1—Cooperate with the American Warehousemen's Association Committee on Banking in the preparation of material on banking in connection with the warehouse industry.

2—Advise membership with respect to problems pertaining to banking and its relationship to the warehouse industry, collateral loans, use of warehouse receipts as collateral, proper forms, etc.

3—Promote distribution of banking brochure — To the Bankers of America —; activities to educate bankers on the advantages and proper use of warehouse receipts as collateral.

4—Guide and advise Executive Office in connection with above activities.

Committee on Emergency Plans

Chairman: V. O. Appel, Chicago, Ill.; Ex. Com. Liaison: J. P. Johnson, Washington, D. C.

Members: G. D. Allman, Chicago, Ill.; Herbert Farnsworth, Boston, Mass.; W. C. Hudlow, Jr., Chattanooga, Tenn.; Edwin M. Neylon, St. Louis, Mo.; Allen Rushton, Birmingham, Ala.; M. W. Young, San Francisco, Calif.

The functions of the Committee are to:

1—Prepare and submit to government agencies concerned plan for warehouse operations under emergency conditions with special emphasis on space allocation and priorities.

2—Maintain constant liaison and cooperation with government agencies concerned with refrigerated warehousing. Keep these agencies informed as to industry conditions and facilities.

3—Promulgate to entire membership plans developed, and stress defense needs to same.

4—Guide and advise Executive Office on emergency plans matters.

Committee on Insurance and Safety

Chairman: A. G. Janney, Baltimore, Md.; Ex. Com. Liaison: F. D. Newell, Jr., Minneapolis, Minn.

Members: Charles E. Adams, Jersey City, N. J.; Wm. L. Baker, Seattle, Wash.; Walter E. Bernd, Washington, D. C.; B. L. Bertel, Fargo, N. D.; Don D. Eckis, Miami, Fla.; E. E. Hesse, Chicago, Ill.; J. C. Irwin, Kansas City, Mo.; Irving Kraft, Seattle, Wash.; H. B. Lasky, Oswego, N. Y.; F. L. Lockwood, Des Moines, Iowa; Jack H. McGoldrick, Seattle, Wash.; W. E. Osborne, Los Angeles, Calif.; A. R. Shepherd, Chicago, Ill.; Raymond N. Tuller, Springfield, Mass.

The functions of the Committee are to:

1—Secure data to urge and justify to insurance underwriters reductions in the various rates for fire insurance used by refrigerated warehousemen; building, machinery, furniture and fixtures, and contents, with consequential damage clauses.

2—Secure data with respect to compensation insurance, better experience ratings, safety measures possible of application; cooperation with the National Safety Council, NAPRE and ASRE in their safety programs.

3—Secure data on various types of insurance coverage; legal, liability, business interruption, and other forms of insurance beneficial to refrigerated warehousemen.

4—Collect and prepare statistics on industry coverage, losses, etc.

5—Study safety needs of the industry and recommend steps, activities and programs warehousemen can follow to reduce costs through accident reduction.

6—Guide and advise Executive Office activities in connection with above.

Every reduction and saving accomplished by the work of this committee, and there are great possibilities, means a saving in dollars to every member of the association.

Committee on Legislation

Chairman: Jerry P. Johnson, Washington, D. C.; Ex. Com. Liaison: C. E. Simmon, Oklahoma City, Okla.

Members: Paul Ashley, Fresno, Calif.; Roger J. DeHoust, Brooklyn, N. Y.; Richard Doncaster, Holley, N. Y.; Chas. F. Foley, Chicago, Ill.; R. M. Hagen. Los Angeles, Calif.;W. B. Haggerty, Tampa. Fla.; Paul V. Henningsen, Portland. Ore.; Charles L. Henry, Atlanta. Ga.; T. M. Hines, Charlotte, N. C.; Philip G. Kuehn, Milwaukee. Wis.; G. T. Lawrence, Topeka, Kansas: J. R. Shoemaker, Elmira, New York; Gilbert J. Stecker, Louisville. Ky.; E. F. Swanberg, Seattle, Wash.; A. F. Versen, St. Louis, Mo.; Horace W. Wilson, Philadelphia, Pa.

The functions of the Committee are to:

1—Follow all legislation closely and alert membership to action on vital issues.

2—Steer association legislative activity.

3—Guide and advise Executive Office regarding above activity.

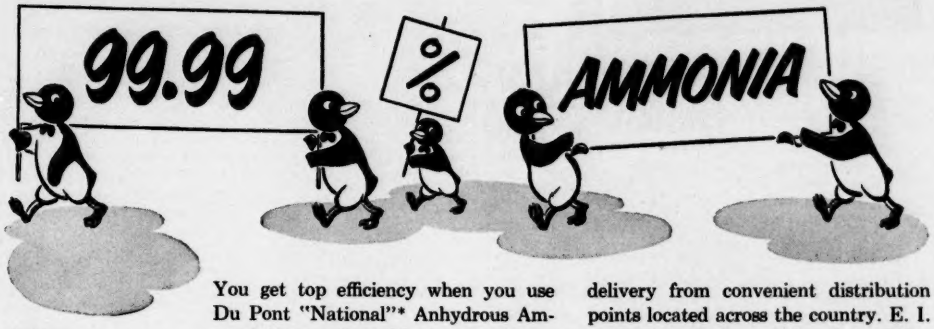
Committee on Membership

Chairman: Philip G. Kuehn. Milwaukee, Wis.; Ex. Com. Liaison: W. C. Hudlow, Jr., Chattanooga, Tenn.

Members: W. J. Amos, Jr., Jacksonville, Fla.; L. L. Baker, Los Angeles, Calif.; F. H. Blake, Jr.; Waterport, N. Y.; W. L. Davis, Minneapolis, Minn.; J. L. Dawson, San Francisco, Calif.; W. Paul Faulkner, Lubbock, Texas; George L. Gross, Duluth, Minn.; C. B. Hart, Tacoma, Wash.; George F. Hilgemeier, Indianapolis, Ind.; John Jacobson, Worcester, Mass.; S. A. Kadane, Dallas, Texas; A. E. Soli, Everett, Wash.; H. W. Sumner, Kansas City, Kans.; Howard K. Upham, Memphis, Tenn.

The functions of the Committee are to:

1—Activate and promote membership campaign among the members of the Association. Actually the membership at large constitutes a membership committee, with above named members as "sponsors" of all local activity.



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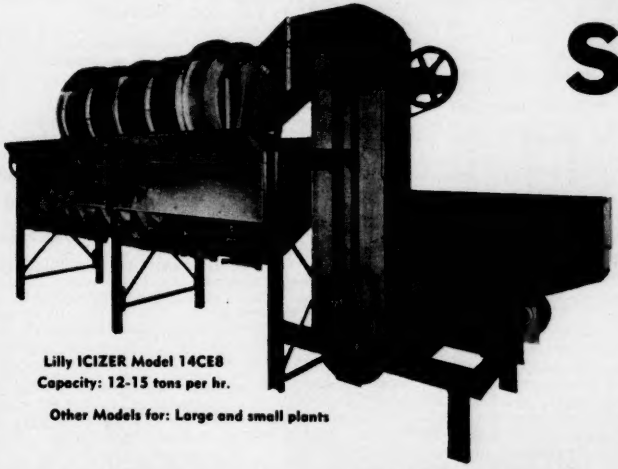

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ICE TOOLS—PLANT SUPPLIES
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- Tongs
- Tank Supplies

ORDER NEXT YEAR'S NEEDS NOW

2—Furnish list of non-members in the various chapters calling upon the nearest members to call, establish personal contact and urge membership.

3—Prepare memoranda, circulars, etc., urging membership, showing advantages, etc.

4—Cooperate and advise with National Office in membership promotion activities.

Committee on Public Information

Chairman: Garth A. Shoemaker, Elmira, N. Y.; Ex. Com. Liaison: A. B. Efroymson, Cleveland, Ohio.

Members: W. K. Davis, Lexington, N. C.; E. G. Erickson, Chicago, Ill.; J. V. Grubbs, Mobile, Ala.; Stewart C. Johnson, San Antonio, Texas; Irving Kraft, Seattle, Wash.; Richard D. Lamb, Freewater, Ore.; W. J. Mills, Los Angeles, Calif.; W. Irving Moss, Jr., Kansas City, Kansas; A. W. Oakley, Jersey City, N. J.; C. C. Powell, Sacramento, Calif.; Conrad Proebstle, Atlantic City, N. J.; Miss M. C. Rogers, Little Rock, Ark.; Joe Waller, York, Nebr.

The functions of the Committee are to:

1—Handle all matters pertaining to public relations, and the preparation and/or approval of all trade journal and magazine articles relative to the industry with respect to public information. Such articles to appear over the names of recognized and competent cold storage warehousemen.

2—Provide suggestions to membership for the improvement of public relations and dissemination of information on the industry in their areas; provide speakers on refrigerated storage before forums, clubs, etc.

3—Inter and intra industry dissemination of information collected in annual statistical survey. Also dissemination of this information to general public, government, etc.

4—Handle matters pertaining to cold storage reporting to government agencies.

5—Assist in Civilian Defense programs, insofar as our industry is concerned, in collaboration with the Insurance & Safety, and Warehouse Operations Committees.

6—Supervision of preparation of Warehouse Directory, data, pictures, advertising, etc.

7—Assist and guide Executive Office regarding above and related activities.

Committee on Transportation

Chairman: M. W. Young, San Francisco, Calif.; Ex. Com. Liaison: J. L. Gagini, Omaha, Nebr.

Members: John L. Bear, Wichita, Kans.; C. A. Bowen, Jr., Nashville, Tenn.; Charles H. Condrey, Modesto, Calif.; C. V. Deakins, Fort Worth, Texas; E. M. Dodds, Kansas City, Mo.; Richard Doncaster, Holley, N. Y.; J. R. Goodfellow, Seattle, Wash.; W. J. Lamping, Detroit, Mich.; Walter I. Massey, Chicago, Ill.; R. S. McCrea, Muskegon, Mich.; A. L. O'Connor, St. Joseph, Mo.; J. W. Patterson, Jacksonville, Fla.; Donald C. Roberts, Salem, Ore.; J. R. Shoemaker, Elmira, N. Y.; Willis Warren, Milwaukee, Wis.; S. C. Wentworth, San Antonio, Texas; W. W. Wilson, Brooklyn, N. Y.

Functions of this Committee are to:

1—Investigate and recommend on all matters pertaining nationally to traffic, storage-in-transit, demurrage, refrigerator car supply, truck transportation, etc.

2—Report improvements in refrigerator cars and trucks, and other transportation equipment.

3—Guide and advise Executive Office regarding above and all transportation and, in general, all traffic subjects.

Committee on Warehouse Operations

Chairman: J. J. Gallery, Watertown, Mass.; Ex. Com. Liaison: H. C. Emerson, Bridgeton, N. J.

Members: B. L. Bertel, Fargo, N. D.; Roy V. Bennett, Seattle, Wash.; William C. Buck, Columbus, Ga.; W. K. Davis, Lexington, N. C.; John K. Dozier, Houston, Texas; Z. B. George, Atlanta, Ga.; Wm. Giacomazzi, San Jose, Calif.; James H. Kuehn, Milwaukee, Wis.; Harry B. Lasky, Oswego, N. Y.; J. F. Meagher, Baltimore, Md.; R. H. Mehrkens, San Jose, Calif.; F. H. Prusa, Cleveland, Ohio; Donald C. Roberts, Salem, Ore.; F. J. Roos, Davenport, Iowa; Dan Shirley, St. Paul, Minn.; C. D. Watson, Glassboro, N. J.; W. Warren Wilson, Camden, N. J.

The functions of the Committee are to:

1—Investigate and recommend to membership on matters of warehouse operation pertaining to handling, mechanized or otherwise, improvements in engine room operation, etc.

2—Cooperate and work closely with The Refrigeration Research Foundation in its research work, referring to it technical problems of temperature and caring for commodities.

3—Prepare and publish under names of warehousemen articles in trade journals and other publications pertaining to warehouse operation.

4—Advise on preparation of annual statistical questionnaire, type and phrasing of questions to be asked.

5—Guide and advise Executive Office on all "operations" problems.

New Bill May Reduce Government Competition

GOVERNMENT competition with private enterprise in the warehousing field will be considerably lessened if Congress passes a Bill introduced on August 21, 1951, by Prepresentative Hale Boggs (D., La.).

The Bill, H. R. 5263, is intended "to amend the Foreign Trade Zones Act of 1934, (so as) to extend certain privileges to qualified public warehousemen." In effect, it places private warehousemen on an equal footing with government-operated Foreign Trade Zones in handling import merchandise on which customs duty is to be collected.

Since establishment of the Foreign Trade Zones in 1934, warehousemen have sought revision of the law which they assert places them in direct competition with non-tax-paying public agencies endowed with exceptional privileges.

The American Warehousemen's Association has led the fight against the Trade Zone legislation. Jay Weil, Jr., of New Orleans is Chairman of the AWA Committee on Bonded Warehouses and Foreign Trades, and has directed the activities of his committee in this campaign for business freedom.

Tax Amortization Issued For Food Storage

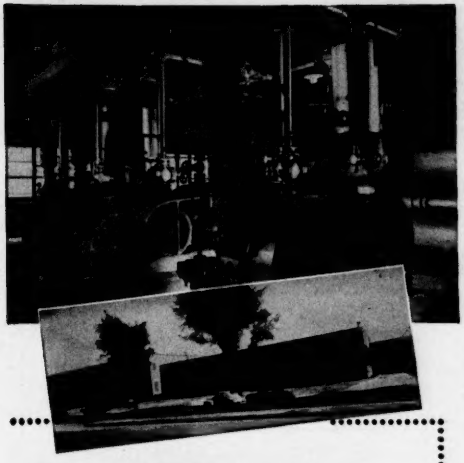
CERTIFICATES of necessity for accelerated tax amortization on new food storage facilities have been issued by the Defense Production Administration to the Northwestern Ice & Cold Storage Co., Portland, Ore., cold storage facilities. Applied for $40,375 of which 65 percent was certified.

Henry Kuehn in Hospital

HENRY C. KUEHN, president of the Wisconsin Cold Storage Company, Milwaukee, Wis., suffered a heart attack at his office August 16. He was taken to a hospital immediately and was transferred to his home September 10. He will be at home for another month and it is expected that it will take two or three months beyond that to effect complete recovery. His progress is good and he is reported coming along nicely.

Control of Odors

THE United States Bureau of Standards has issued a 12-page booklet on "Control of Odors" which will be of interest to the refrigerated warehousing trade. The booklet concludes with "the best solution is to find the material that is the source of the odor and remove it if possible."



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Sealtest ICE CREAM IN NATIONAL DAIRIES' NEW MILWAUKEE PLANT

● When National Dairies engineers were considering refrigeration for the contemplated new Luick Ice Cream Company plant, they naturally gave thought to the equipment which had faithfully served through the years. They discovered that Luick had bought their first Vilter compressor in 1911 and has been buying Vilter ever since.

Refrigeration had advanced over the years, along with the process of ice cream manufacture, so no thought was given to moving the old equipment, but rather toward buying an entirely new system. Promised efficiency improvements were realized through the installation of the four Vilter multi-cylinder compressors shown, three twin cylinder boosters, shell and tube condensers, and other equipment.

Dairies, ice cream plants, and food processors have known for years that they can depend upon Vilter. You'll find them re-ordering Vilter, as Luick has done, time after time, because they've found that Vilter saves them money in upkeep, in operating costs, and in lack of costly "down time."

Let your nearest Vilter Representative or distributor show you how you can save with Vilter.

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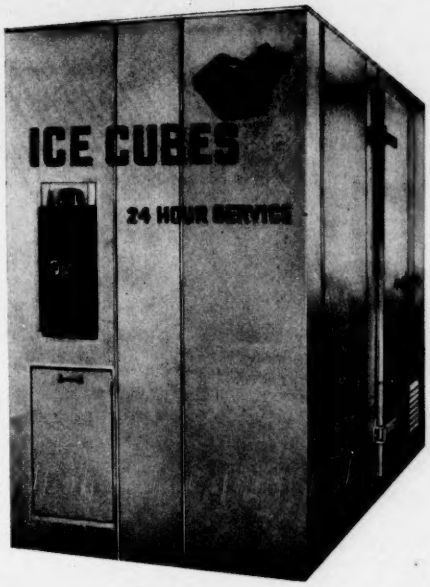
Ammonia and Freon Compressors • Pakicers • Evaporative and Shell & Tube Condensers • Pipe Coils • Valves and Fittings • Can Ice Plants

The NEW POLAR CUBED and CRUSHED ICE VENDING STATION



Patented—Design Patent Applied For

Belt Capacity— 50 ten-pound bags
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PRICE: LESS THAN $1500.00

POLAR PRODUCTS ARE BUILT OF THE FINEST MATERIALS BOTH *EXTERNALLY* AND *INTERNALLY*.

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1. Completely covered with embossed aluminum.
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3. Aluminum foil vapor seal paper.
4. Automatic electric defrost.

ALL of these special POLAR features are included in the new Premium ice vending units.

1. Gives maximum utilization of refrigerated space. Ice can be bagged in station.
2. Fits in a small space, easily placed. Cabinet is 8'-10" long, 6'-6" high, 46" wide. Specially suited for heavily populated downtown locations.
3. Shipped ready to operate—just plug in. Equipped with front light and time clock.
4. Beautiful in appearance. Identical material as used in regular POLAR line.
5. One piece aluminum weatherproof roof.

For further information and descriptive literature-- write

REFRIGERATION ENGINEERING COMPANY
Montgomery, Minnesota

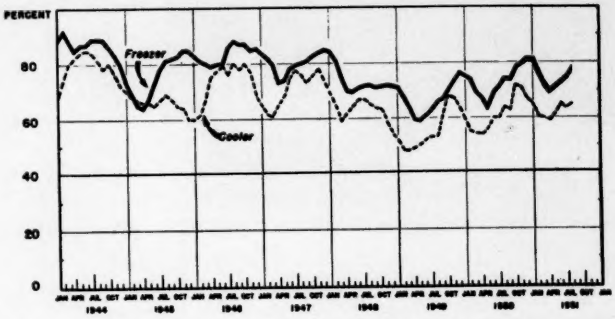
August 31 Cold Storage Holdings

AN increase of one point in cooler and two points in freezer utilization during August raised the occupancy levels to 65 and 78 percent, respectively, by August 31. Occupancy of 65 percent of public cooler space compares with an average August 31 occupancy of 68 percent and 64 percent a year ago. Only three regions, the South Atlantic, East South Central, and Pacific, showed increases in cooler utilization during August; however, in the latter two regions there were significant increases of eight and 11 points.

Freezer occupancy, at 78 percent, was two points above average and four points above the occupancy level of a year ago. Decreased freezer utilization was reported in the West North Central, East South Central, and West South Central Regions. Public refrigerated storages in Buffalo showed the highest occupancy level for key cities with 99 percent of cooler and 89 percent of freezer space reported to be in use. Both cooler and freezer space in Norfolk, Memphis, and San Francisco was reported to be 85 percent or better occupied.

The weight of refrigerated commodities in storage August 31 amounted to 3.5 billion pounds, a seven percent increase over the previous month's total. Cooler-held items totaled 1.5 billion pounds while commodities stored in freezer space amounted to two billion pounds. A net cooler weight increase during August of 230 million pounds was accounted for mostly by the seasonal into-storage movement of fresh pears. There was a five million pound decrease in freezer-held commodities during August. Net into-storage movements of frozen fruits and vegetables, butter, poultry, beef, lamb, mutton, and veal were not quite sufficient to counteract withdrawals of the other freezer items.

A seasonal net into-storage movement of fresh pears brought national holdings to almost 6 million bushels as compared with 4 million bushels in store last year. Apples in storage by the end of August had been reduced to 261,000 bushels.



Occupancy of Refrigerated Warehouses 1944-1951.

During August seasonal increases were reported in stocks of canned fruits and vegetables, onions, celery, and peanuts whereas dried and evaporated fruits, potatoes, other fresh vegetables, and tree nut meats were in lesser supply.

Holdings of frozen fruits increased 16 percent during August and by the end of the month totalled 368 million pounds. This compares with 318 million pounds in storage last month and 333 million in store last year. During the 5-year period ended 1950, average August 31 frozen fruit stocks were 359 million pounds. While total national holdings were greater than average for this time of year, stocks of apricots, blackberries, peaches, plums and prunes, raspberries, Young, Logan, and similar berries were below their respective 5-year average levels. Of the 51 million pounds net increase in frozen fruit stocks more than half was attributable to the storage gains

TABLE I—COLD STORAGE HOLDINGS IN PUBLIC, PRIVATE AND SEMI-PRIVATE WAREHOUSES, APPLE HOUSES AND MEAT PACKING PLANTS (000 LBS.)

	Aug. 31, 1951	July 31, 1951	Aug. 31, 1950	Five-year Average
Meat and meat products, lbs.	603,536	700,943	466,263	453,921
Lard and rendered pork fat, lbs.	47,089	45,997	62,166	62,225
Frozen poultry, lbs.	120,286	106,692	105,179	133,408
Creamery butter, lbs.	116,964	104,405	239,398	132,844
American cheese, lbs.	237,271	227,199	287,977	190,596
Other cheese, lbs.	28,296	26,799	22,066	27,286
Shell eggs, cases	1,653	2,270	2,568	4,074
Frozen eggs, lbs.	176,562	190,818	155,369	201,272
Apples, bu.	261	294	102	...
Frozen fruits, lbs.	368,338	317,755	333,030	358,573
Frozen vegetables, lbs.	439,130	369,311	361,366	311,095
Frozen fish, lbs.	196,060	181,251	182,356	172,472

TABLE II—PERCENTAGE OF SPACE OCCUPIED BY PUBLIC COLD STORAGE WAREHOUSES (APPLE HOUSES EXCLUDED)

	Net Piling Space (000 cu. ft.)		Aug. 31, 1951 (%)		July 31, 1951 (%)		Aug. 31, 1950 (%)		5-Year Average (%)	
	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer
New England	3,098	5,996	38	82	41	80	45	70	56	77
Middle Atlantic	36,132	31,883	56	83	57	80	50	77	59	79
East North Central	26,934	24,226	76	78	76	78	76	70	75	73
West North Central	9,080	14,017	66	76	68	80	80	80	79	77
South Atlantic	8,672	6,580	70	82	68	78	59	69	67	77
East South Central	2,710	3,107	85	86	77	87	76	86	79	82
West South Central	6,777	7,158	66	61	67	62	61	59	69	66
Mountain	1,640	2,345	54	72	54	69	58	77	71	79
Pacific	15,915	20,630	65	75	54	70	65	76	67	76
United States	110,958	115,942	65	78	64	76	64	74	68	76

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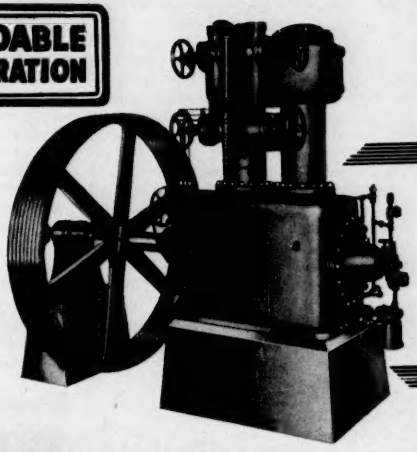

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TABLE III—PERCENTAGE OF SPACE OCCUPIED BY PRIVATE AND SEMI-PRIVATE REFRIGERATED WAREHOUSES AND MEAT PACKING PLANTS (APPLE HOUSES EXCLUDED)

	Private and Semi-Private Warehouses						Meat Packing Establishments					
	Net Piling Space (000 Cu. Ft.)		Space Occupied—Per Cent Aug. 31, 1951		July 31, 1951		Net Piling Space (000 Cu. Ft.)		Space Occupied Aug. 31, 1951		July 31, 1951	
	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer
New England	.....	.....	..	..	56	86	.....	.....	..	..	..	..
Middle Atlantic	2,169	1,710	26	87	44	86	1,441	266	84	86	87	91
East North Central	5,960	5,580	54	44	58	54	3,907	1,079	84	90	83	89
West North Central	513	2,354	90	69	86	71	12,100	5,945	91	79	88	88
South Atlantic	576	4,218	22	77	22	81	957	238	86	100	86	100
East South Central	.....	.....	..	..	..	..	509	119	89	86	91	91
West South Central	202	57	80	89	90	86	1,199	501	100	100	100	100
Mountain	104	47	97	30	97	47	735	437	89	98	86	98
Pacific	3,235	4,061	40	80	47	58	2,723	530	88	89	91	93
United States	12,759	18,027	46	67	55	66	23,571	9,115	89	84	88	90

NOTE:—Blank spaces indicate that insufficient returns were received.

of cherries and blueberries. Orange concentrate stocks decreased almost 3 million gallons during August to 17 million and by the month's end were almost twice stocks in store last year.

For the third consecutive year frozen vegetable stocks increased by as much as 70 million pounds during August. In 1949 and 1950 the seasonal gain was 78 million pounds. With 439 million pounds in storage a new August 31 record was reached. By comparison, frozen vegetable holdings last year amounted to 361 million pounds while average August 31 stocks were 311 million pounds. All frozen vegetable items, however, did not reflect seasonal gains.

Twice the average amount of cream moved from storage during August leaving 46 million pounds on hand. Despite this, however, stocks were still greater than last year.

Season gains of creamery butter stocks brought the national total to 117 million pounds which compares with 239 million in store last year this time. Although the net August gain was slightly greater than average, creamery butter stocks were about 16 million pounds below average and were only about 32 million pounds above the August 31, 1946 record low.

American Cheddar cheese increased 10 million pounds during August to a total of 237 million which compares with 191 million pounds in store during the 5-year period ended 1950. Last year 288 million pounds of American cheese were in storage.

Shell egg stocks dropped from 2.3 million to 1.7 million cases during August. National supplies a year ago were 2.6 million cases while average August 31 stocks were 4.1 million cases. A net decrease of 14 million pounds of frozen eggs brought total supplies down to 177 million pounds.

Frozen poultry stocks increased to 120 million pounds as a net gain of 14 million pounds was reported during August. Classificationwise, broilers showed a slight increase; fryers were up two million pounds since July 31; roasters increased one million; fowls, six million pounds; ducks, three million pounds, and miscellaneous poultry reflected a net increase of a million pounds. Turkeys, only, decreased during August. Stocks were down four million pounds to 26 million.

A greater than average August increase raised national stores of beef to 98 million pounds. Not since 1945 has there been as much beef in storage as was reported last month.

Frozen pork stocks decreased to 206 million pounds as more than 83 million pounds moved from storage. Seasonal decreases in total pork stocks amounted to 102 million pounds during August as compared with 91 million last year and 104 million during August for the 5-year period ended 1950. National pork holdings were 394 million pounds which compares with 276 million normally in store this time of year.

Lard and rendered pork fat stocks were reduced to 35 million pounds by August 31, thereby reflecting a net out-of-storage movement of 12 million pounds. Average August decrease was 26 million pounds while last year this time more than 30 million pounds moved from storage.

Frozen and cured fishery products in store on August 31 amounted to 196 million pounds as more than 14 million pounds moved into storage during August. Frozen fishery products increased 12 million during the month to 159 million pounds while cured fishery products increased to 37 million pounds.

Storage Outlook

Cooler space utilization during September should reflect the seasonal increase expected in storage holdings of apples and pears. While the pear storage season has already begun, the storage of apples should get under way in September. Freezer occupancy during September may not be much higher than the level reported August 31. Although frozen fruits, vegetables, and poultry should continue to move into storage, net withdrawals of frozen eggs and meats will tend to keep occupancy at or about the 78 percent reported last month. During the 5-year period ended 1950, freezer occupancy on September 30 was the same as the month previous. This pattern also prevailed last year.

Canadian Holdings of Fruits and Vegetables

THE Dominion Bureau of Statistics of Canada, Agricultural Branch, report the following commodities held in cold storage on August 1, 1951.

Frozen fruit holdings in storages and factories August 1, 1951 amounted to 20,111,000 pounds as compared with 15,557,000 pounds July 1, 1951 and 20,527,000 pounds August 1, 1950.

Stocks of frozen vegetables in storages and factories on August 1, 1951 amounted to 8,017,000 pounds as compared with 5,484,000 pounds July 1, 1951 and 9,466,000 pounds August 1, 1950.

Refrigeration for Eggs

A WEEKLY profit of $30 (about $1500 yearly) is the estimate of value placed on mechanical refrigeration of eggs by Mrs. Clara Franklin, owner-operator of a 3,000 hen ranch at Baldwin Park, Calif. The estimate of profit is based on superiority of mechanical refrigeration (55 F) over evaporative cooling. She saves on efficiency of operation of her holding room and gains on higher quality and prices.

Storage of Cut Flowers

STUDIES on long term storage of cut flowers has been reported by the Maryland Experiment Station. Carnations, for example, have been stored for six weeks at 31 F with good post-storage life. Giving carnations and snapdragons a good drink of 10 percent sugar solution before they were packaged and stored, improved their storage quality.

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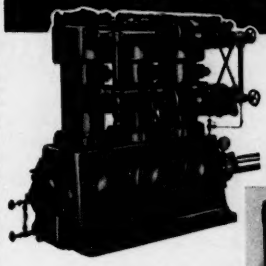

Below—Piston assembly and suction valve cage.

Left—Connecting rod, bearing, and piston pin.

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New High for Processed Fruits and Vegetables

A RECORD volume of canned, frozen, and dried fruits and vegetables were inspected for quality and condition during the year ended June 30, 1951, the U. S. Department of Agriculture announced.

The service, supervised by the Fruit and Vegetable Branch of the Production and Marketing Administration, inspected over 150 million cases of canned fruits and vegetables; over a million cases of canned marine products; nearly a billion pounds of frozen foods; over a hundred million pounds of dried and dehydrated products, and 83 million pounds of other processed products, such as honey and peanut butter.

In addition to doing work for the commercial trade, inspection was furnished for Federal school lunch purchases, dried fruits and honey diversions, and Government purchase and export programs. Also, inspections were made for California to assist that State in determining compliance with the State Date Marketing order, and all processed citrus products in Florida were inspected to assist that State in determining compliance with the Florida Citrus Code of 1949.

One hundred and thirty-four fruit and vegetable processing plants owned by 104 companies were approved to pack under continuous Federal inspection as of June 30, 1951. Under this type of operation the inspections of canned fruits and vegetables and frozen fruits and vegetables increased 10 and 45 percent respectively over the previous year. The increased inspections were due to the increased number of plants approved to pack under this service and to an increase in production by plants already operating under continuous inspection.

Fees payable to the Service from inspections totaled $1,739,000 and slightly exceeded the cost of inspection personnel.

The U. S. standards for grades of processed fruits and vegetables now total 103, including 70 for canned foods, 9 for dried, and 24 for frozen fruits and vegetables. New standards were issued for two commodities and 10 standards were revised. Data were collected and analyzed and preliminary drafts were prepared during the year for standards on canned beets, pears, concentrated orange juice, frozen apples, asparagus, cauliflower, dried apples, prunes and raisins.

Federal specifications were developed during the year for 27 canned and frozen commodities. These specifications, which are used by the Defense Department and other government agencies, cover type of processing, packaging, marketings, and other factors in addition to U. S. standards for quality.

U. S. Standards for Grades Of Frozen Foods Issued

THE U. S. Department of Agriculture has announced a proposed revision of the U. S. standards for grades of frozen apples which have been in effect since August 1, 1945. The proposed changes are the result of studies made by the Department and of suggestions made to the Department by industry representatives. The changes include a new basis for determining the requirement for carpel tissue, a slight change in color requirements, and new definitions for sizing frozen apples. Interested parties may submit during the next 30 days views and comments to the Fruit and Vegetable Branch, Production and Marketing Administration, Dept. of Agriculture, Washington, D. C.

For the first time, U.S. standards for grades of frozen field peas and frozen black-eye peas, and frozen diced carrots have been issued. The standards will become effective for use October 15. Grades of frozen field peas and frozen black-eye peas are designated as U.S. Grade A or U.S. Fancy; U.S. Grade B or U.S. Extra Standard; and Sub-standard. The factors of color, absence of defects, and character are considered in conjunction with other requirements in ascertaining the grade of the product.

The grades of frozen diced carrots are designated as U. S. Grade A or U. S. Fancy; U. S. Grade B or U. S. Extra Standard; and Substandard. The grade of the product is ascertained by considering, in conjunction with other requirements, the respective ratings of the factors of color, uniformity of size and shape, absence of defects, and texture.

Sea Food Inspection of Fresh and Frozen Shrimp

AT THE request of a packer of fresh iced and frozen shrimp, the Federal Security Agency is considering the extension of these products of the sea food inspection service under section 702A of the Federal Food, Drug, and Cosmetic Act.

The inspection would be purely voluntary. Any packer could apply for it or not, as he chose, just as packers of canned shrimp and oysters have been doing for years.

Sea food which is packed under inspection is entitled to a label statement that it has been prepared under Government supervision.

The proposed regulations for inspection of frozen and fresh iced shrimp will permit packers of shrimp and oysters to operate in any one of the following ways: (1) Without any Government inspection; (2) with Government inspection of shrimp-canning operations alone; (3) with Government inspection of oyster-canning operations alone; (4) with Government inspection of shrimp freezing and fresh icing operations alone; (5) with government inspection of any combination of items 2, 3, and 4 above.

Frozen Spring Spinach Pack Greater than Last Year

THE 1951 pack of Frozen Spring Spinach reached a total of 54,807,043 pounds, according to a tabulation prepared by the National Association of Frozen Food Packers. This total was nearly twice as great as the 1950 spring pack, and larger than the spring pack in any earlier year.

Very great production increases were reported for all regions, and for practically all container-size classifications. The pack in retail sizes this year was about double that of 1950, and a corresponding increase was indicated for small institutional sizes.

August 10, 1951 total United States pack 1944 to 1948 was as follows:

YEAR	POUNDS
1944	12,794,679
1945	12,661,154
1946	18,306,950
1947	11,779,585
1948	19,460,909

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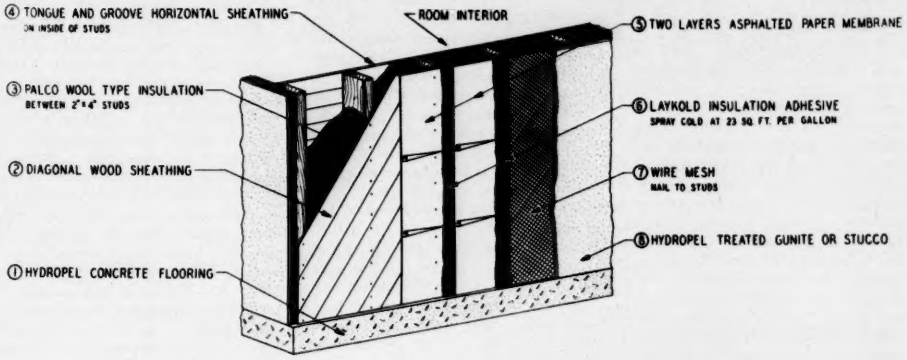
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CAUSES OF HIGH POWER COST

Losses in efficiency in refrigeration systems can be attributed to one or more of the following:

- **NON-CONDENSABLE AND FOUL GASES**
  Cause excess head pressure and reduced capacities.
- **WATER AND OIL IN THE SYSTEM**
  Lowers capacity by raising the boiling point of liquid refrigerant.
- **DIRTY CONDENSERS**
  Scale raises condensing pressure and lowers capacity.
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  Keeps discharge pressure high—increases power consumption.

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Frozen Foods

Freezing Dressed Poultry

A SLIGHTLY puffed appearance (plumping) of dressed poultry does not increase moisture absorption, according to Maryland Agricultural Experiment Station, although previous investigations and industry technical personnel do not fully concur in this conclusion.

Research at the station has also shown that scalding at 140 F, has some advantages over the conventional 127-130 F, such as removal of almost all feathers, including pins, by mechanical pickers, removal of epidermal layer of skin with improvement in appearance, and less actual absorption of water through the skin during cooling. The birds are scalded 30 seconds at 140 F. Since loss of the epidermal layer is more conducive to drying, special attention to packaging is necessary. There is, of course, danger from raising the scalding temperature too high above 140 F, the so-called "hard-scald" appearance may develop. This new method is called subscald.

Freezing Crab Meat

THE first results of the study on freezing and storage of crab meat conducted at College Park, Md., by the U. S. Fish & Wildlife Service and the University of Maryland, a project of the Refrigeration Research Foundation, have been compiled.

The work was done by George S. Morrison. The author has found active enzyme in cooked and frozen crab meat and has studied the changes it causes in relation to texture. Apparently the heating in commercial processing is inadequate to counteract this activity although, as is well known, scalding is used to stop enzymic activity in frozen vegetables. Further studies of these changes seem advisable, and attention will be given to possible inhibitors of the enzyme.

Reducing Fat Content of Sausage in Frozen Storage

FAT content of sausages could be reduced in frozen storage by as much as 25 per cent without loss in either palatability or keeping quality. This was shown by tests in the food chemistry section of the Division of Applied Biology of the National Research Council of Canada, and by data obtained with food tasting panels in the division's statistics section, the Council reports.

Engineers Required For Refrigerating Systems

THE City Council of Kansas City, Mo., recently unanimously passed an ordinance clarifying which refrigeration systems require the presence of an engineer on the premises at all times. Councilman Ilus W. Davis pointed out that most stores and other places having refrigeration systems would not be required to have engineers present all the time.

The ordinance provides that refrigeration systems of more than ten tons containing any group 2 or 3 refrigerants shall be operated under direct charge of an engineer.

The ordinance requires annual inspection for all systems of eleven horsepower or more and containing forty pounds or more of refrigerant in any group 1 refrigerant, or any unit with a capacity of two tons or over containing group 2 or 3 refrigerants except in one or two family dwellings.

Representatives of concerns having large refrigeration or air conditioning systems previously had appeared before the City Council to protest the proposed ordinance.

Taxes Reach Danger Mark

IN the Sixth Legislative Report for 1951, Jerry P. Johnson, president of the National Association of Refrigerated Warehouses says: "Economists who specialize in taxation have a theory, bolstered by experience in several European countries, including Britain, that whenever the government taxes are more than a quarter of the total national earnings in taxes, the process inevitably breeds inflation. The tax take in the United States last year was 29 percent of the national income — well above this danger mark. The administration's present tax program would take nearly one-third of all the money the people of the United States earn." Do you see why taxes are bothering you?

Ripening Tomatoes

BRITISH research workers, Fidler and Nash OWortham at Covent Garden Laboratory, have found that English glasshouse and outdoor tomatoes ripen to good quality from the green or turning stage at 65 to 70 F at high relative humidity, but they were not able to demonstrate consistent ripening effect by additions of ethylene to the storage atmosphere. In some cases they noted acceleration and in others there was none.

Cold Storage and Fisheries

(Continued from page 44)

The Damon and Pythias relationship between the fishing industry and cold storage warehousemen is exemplified by the harmony existing between the two industries' trade groups —NARW and NFI.

Sparked by the progressive leadership of its trade association—NARW —the cold storage industry forges ahead. Devoting time, energy and money to meeting customer needs, the industry's service standard is as up to date as the day after tomorrow.

Numbered among its preferred customers such alert business groups as the American fishing industry, warehousemen are confident that their opportunities for service, as a vital link in the chain of food distribution, will multiply in time to come. They are geared to the growth of strong customer industries. And they are proud to be a full working partner in the big league of the nation's perishable food suppliers.

Health Director Warns Of Refrigerator Hazards

DISTRICT Public Health Director Daniel L. Seckinger, Washington, D. C., warned of the danger of carbon monoxide gas escaping from home gas refrigerators, particularly the old water-cooled type.

Gas refrigerators should be inspected regularly, he said, because when they are not working properly combustion is incomplete and deadly gas may be formed in considerable quantity. He urged regular cleaning of the combustion unit. As an added precaution, he suggested leaving a window open about two inches from the top while the refrigerator is in use.

Seckinger said about 2400 water-cooled gas refrigerators are still in use in Washington and about 31,400 of the newer air-cooled type. He said the Washington Gas and Light Co. is making a survey of the situation and expects to be able to meet all service needs.

Precooked Frozen Meat

A STUDY has been made on pork and beef stews and Swiss steak at Kansas State College, Manhattan. The meat had been stored frozen, wrapped in aluminum foil for a short time and the stews were packaged in plastic bags. Results showed a gradual decline in quality which at 0 F reached the slightly undesirable stage in six to nine months. There was no pronounced comparative advantage in minus 10 F. The beef stew fared appreciably better than the pork stew and the Swiss steak.

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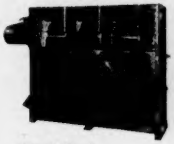

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French Lick Springs Hotel

Liquid Carbonic Builds New Canadian Plant

THE Liquid Carbonic Canadian Corp. has completed its new carbonic gas and dry ice plant in Winnipeg, Canada. The plant, which cost over $750,000 will enable the company to quadruple production locally, Canadian oil from Alberta will be used in place of American coke in making carbonic gas. Liquid Carbonic has been established in Greater Winnipeg for over 35 years. It distributes its products in Manitoba, Saskatchewan and northwestern Ontario. It also distributes extracts and bottling machinery to the soft drink industry, soda fountains and flavors to the restaurant trade and brewery machinery to the brewing industry.

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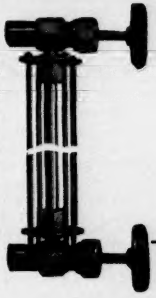

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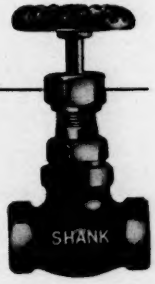

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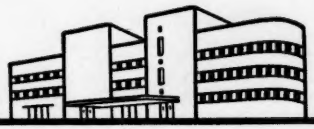
NEW PLANTS and IMPROVEMENTS



This Department each month presents the more important developments covering new constructions, as well as additions, improvements, remodeling, and installations of new equipment in ice and cold storage plants and other industrial plants that use refrigeration. News notes on all such new constructions and improvements are invited.

Arkansas

Dardanelle, Ark.—The Citizen Ice Company has a new refrigeration plant under construction here. The plant is being built in connection with a poultry processing plant.

California

Covina, Calif.—With the purchase of the former Golden Groves packing house at Azusa Ave. and the railroad tracks by the Anaheim Cold Storage Company, it is being converted into a cold storage warehouse for citrus concentrates. Thomas A. Henry, president of the company, announced that because of the heavy production of citrus concentrates in the Covina area, the firm was locating a storage plant in the vicinity. The company has a plant in Anaheim, two in Fullerton and one in Santa Ana. Capacity of the Covina plant will be 40 cars, bringing the company's total storage space to almost 400 cars.

Palos Verdes, Calif. — Completion of the new $20,000 refrigerated storage building of Arden Company milk and ice cream products was announced by Dick Rice. The plant is located at 127 S. Seventh St.

San Francisco, Calif. — Merchants Ice & Cold Storage Company will construct a $1,000,000 plant, located in a two block area bounded by Lombard, Greenwich, Battery and Montgomery Streets. The work will began after demolition of old buildings on the site. Need for a highly mechanized unit to handle the increasing volume of frozen foods and food storage has prompted the modernization and construction program.

Clarksburg, Calif.—The new Clarksburg Cold Storage plant has been opened. The $100,000 plant, located in the middle of one of the pear orchards belonging to Arthur Green and Al Hemly, is capable of handling 55,000 lug boxes of fruit, or 1210 tons.

Indiana

Jasper, Ind.—The Jasper Ice & Fuel Co. has installed a Link-Belt crusher slinger capable of producing one ton of crushed ice in three to four minutes. At present this machine is largely used to top-ice truck loads of dressed poultry from the new Swift & Co. plant in Jasper.

Georgia

Thomson, Ga.—A cold storage plant for the storage of poultry is being built by Mr. and Mrs. W. L. Farr who were the first to start in the poultry business on a large-scale operation in this section.

Kansas

Dodge City, Kans. — The Western Light and Telephone company's ice plant on West Trail Street, recently installed an ice dispensing machine.

Louisiana

Morgan City, La. — St. Mary Seafoods Company, owned by Raymond Egle, has a 30,000 pound capacity freezer under construction as an addition to its plant here.

Nebraska

Omaha, Nebr.—The United States Cold Storage Corporation is planning on building a new plant here. The corporation has received a certificate of necessity amounting to $1,380,000 for the plant's construction.

New York

Brooklyn, N. Y.—Cirillo Bros. Ice Corp. recently installed two S & S ice vending machines.

North Hempstead, N. Y.—The Borden Company's Pioneer Ice Cream Division is constructing an ice cream distribution building here. The 40,000 sq ft structure, 172 by 243 feet, will be located on a 15-acre tract and will have a garage for a fleet of about 40 refrigerated trucks and a hardening room for ice cream storage.

Ohio

Columbus, Ohio — The City Ice & Fuel Co. has installed a second ice vending station at 4967 High Street.

Oxford, Ohio — Ramar Ice & Fuel has installed four new S & S ice vending units. The units were designed for dispensing both block and processed ice.

South Carolina

Columbia, S. C.—Four vending machines, designed for dispensing both block and processed ice, have been installed by the Ramar Ice & Fuel Company.

New Incorporation

McCook, Nebr.—Articles of incorporation were filed with the secretary of state for the McCook Ice & Packing Company. Authorized capital is $50,000. Incorporators are R. A. Drum and J. C. Allgaier of Omaha and Clyde C. White of McCook.

Sales and Reorganizations

Arlington, Calif.—Smith Packing Company, operators of Smith Brothers markets at Hemet and Indio, have taken over equipment of the Mission Meat and Provision Company at what was formerly Camp Anza near here. The firm will move its pork processing facilities from its main packing plant at San Bernardino to increase processing capacity. Lard, hams, bacon and other pork products will be handled at the Camp Anza branch. Equipment at the plant has been purchased, while building and land were leased.

New Haven, Conn.—The K.B.C. Industries, Inc., purchased the plant formerly occupied by the Hygienic Ice Company at 282 Hamilton Street from the National Service Manufacturing Company for $53,000. Joseph Sachs, counsel for the new firm, said the building would be used for industrial purposes which were not disclosed. This is the last piece of property owned by the ice concern.

Olean, N. Y.—Sale of the three-story brick building at 420 N. Union St., by the Ripley & Wands Company to the Crosby Cold Storage Company was announced. The new owner has occupied the building for the last several months. Howard Crosby is president of the company, Charles L. Carlson, secretary, and A. LeRue Sheeser, treasurer. The Riley & Wands Company has operated a wholesale grocery and cold storage business here for half a century. It is the only cold storage building here.

Suffern, N. Y.—The Zero Ice Company building of Suffern Place has been sold to Herbert Greenstein of Ramapo Valley Distributors. According to W. F. Larkin, ice company official, the plant will be dismantled in the fall and most of the machinery will be moved to another company plant in Newburgh.

Maysville, Okla.—Dick Watkins recently announced purchase of the Roberts Ice Dock. Watkins says they will deliver ice.

Fires and Accidents

Waterbury, Conn.—Fire of undetermined origin destroyed the Eastwood Ice Company, an ice house on Plank Road.

Kansas City, Mo. — The Robert Blond Meat Company building, 3022 Prospect Avenue was damaged by fire recently. A $75,000 stock of meat was destroyed in the coolers according to Jack Blond, president of the company. Shortly after the blaze started, the ammonia refrigeration systems of the plant exploded. Employees believed the blaze began among large electric motors in the basement.

NIAGARA AEROPASS CONDENSER (Patented)

Saves half the Engineer's Troubles ...with a Refrigeration Plant

Hundreds of engineers have been interviewed about their experience with the Niagara Aeropass Condenser. In one way or another, they say, "I wouldn't go back to anything else." And their managers, who watch the costs, say, "Best investment we ever made, couldn't operate now, without it."

Niagara Aeropass Condensers have three exclusive features which save trouble and money in running a refrigeration plant:

The "Duo-Pass"— keeps scale and salts from crusting the coils, keeps the condenser always at full capacity.

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The "Balanced-Wet-Bulb" control gives automatic operation at the minimum head pressure, saving power cost the year 'round!

In addition, the Niagara Aeropass Condenser saves nearly all your cost of cooling water, quickly bringing back to you the cost of installation. In plants where refrigeration is a production process, owners know that this condenser has reduced their costs.

Write for Bulletin 103.
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DEATHS

Edward T. Murphy

AFTER a brief illness, Edward T. Murphy, 71, senior vice-president of Carrier Corp. and a member of its Board of Directors since 1930,

Edward T. Murphy

passed away on August 21 in San Francisco. Known throughout the air conditioning and refrigeration industry with which he grew up as "Ned" Murphy, he was one of the seven founders of Carrier Engineering Corp. in 1915, predecessor of the present company. Years before this, as a young employee of Buffalo Forge Company, he worked with the late Dr. Willis H. Carrier when the latter devised and installed the first scientific air conditioning system in 1902.

Born in New York City in 1880, he graduated from Lehigh University with a degree in mechanical engineering in 1901. After a year with Bethlehem Steel Company, he went to Buffalo Forge and was immediately assigned as an assistant to Willis Carrier, himself only recently graduated from Cornell University.

After an interlude as sales engineer for B. F. Sturtevant Company in 1904-1906, he served as Philadelphia Manager for Buffalo Forge Company and its subsidiary, Carrier Air Conditioning Company of America, from 1907 until Carrier Engineering Corporation was formed as an independent company in 1915.

Mr. Murphy was named secretary and shortly thereafter vice president of the new corporation and directed its sales and engineering activities in the Philadelphia area for the next 12 years. He continued as vice president of the present Carrier Corporation after its formation in 1930, and was elected to the Board of Directors. He later served in Newark, N. J., and was in charge of the Chicago district from 1934 to 1939, when he assumed responsibility for all marketing activities at the new headquarters of the corporation in Syracuse, N. Y. He moved to the West Coast late in 1949, and was active there in a consulting capacity up to the time of his brief illness.

He was a member of the American Society of Mechanical Engineers, the American Society of Heating and Ventilating Engineers and the Air Conditioning and Refrigeration Manufacturers Association. He also was a member of Theta Delta Chi and Sigma Xi.

Albert L. Francis

THE death of Albert L. Francis, member of the Los Angeles refrigeration firm of Francis & Carter, occurred September 3. He had been suffering for some time with a serious case of stomach ulcers. He was 64 years old.

Mr. Francis had been active in the refrigeration industry in California for 40 years, He had been with the York California Construction Co., predecessors to the present York Corporation, for 15 years, dating from before World War I. In the 1930's he organized and for six years shared in the operation of the firm of Francis & Schreck. He subsequently established the A. L. Francis Company in Pasadena, and in 1948 organized Francis & Carter, with which firm of refrigeration consultants he was associated at the time of his death.

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TRI-PAK *Crusher-Slingers*

A CHOICE OF FIVE MODELS TO FIT YOUR PARTICULAR OPERATION .....

There is a Tri-Pak ice crusher-slinger for every icing need. Whether you ice fishing boats, top ice carloads of vegetables, or re-ice refrigerator trucks, one of Tri-Pak's five sturdy, dependable units is size-rated for your job. All Tri-Pak crusher-slingers save labor by taking full-sized 300 pound blocks of ice. You can depend on these well engineered, sturdily built icing units.

The "Mobil-Icer" is here icing a carload of carrots at the rate of 5 tons every 7 minutes. The trailer mounted "Mobil-Icer" is ideal for team track icing as it can be towed by the truck carrying the ice. The unit is powered by an 8-cylinder Ford industrial engine. Capacity is 55 tons per hour.

M-337

The M-337, known as "Mobil-Icer," is ideal for team track icing with a capacity of 55 tons per hour. Powered by an 8-cylinder Ford industrial engine.

G-100

The model G-100 rolls easily on 3 rubber-tired, ball bearinged wheels. Powered by an 8 cylinder Ford industrial engine. Capacity 55 tons per hour.

G-35

The G-35 crusher-slinger is for icing operations where its capacity of 750 pounds per minute is adequate. Takes full 300 pound blocks.

E-40

The E-40 combines high capacity with the quietness and dependability of the electric motor. Capacity 55 tons per hour. Powered by a 10 HP electric motor for crushing, 30 HP motor for slinging.

E-13

The E-13 has a capacity of 600 pounds per minute. Uses one 3 HP and one 10 HP electric motor.

YOUR CATALOG

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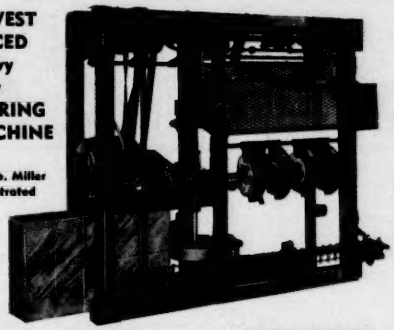

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Write, wire or call for complete details:

RE-BUILDING SERVICE

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• Also a complete stock of spare parts for Perfection and Miller Scorers available for immediate shipment.

Perfection Ice Scoring Machine Co.

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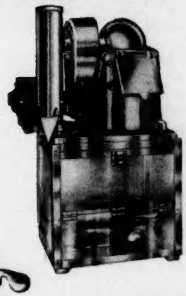
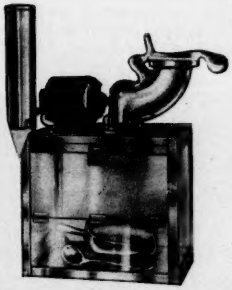
SNO-CONE ICE SHAVERS





Another market for Ice! Sno-Cone shavers are easily rented or sold to carnivals, fairs, Home-comings, Bars, etc.

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Integral Tube Cans
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THE OHIO GALVANIZING & MFG. CO.
NILES OHIO

What's New

MACHINERY
APPLIANCES • PROCESSES

Kooler Kubes to Strengthen Brine

SOLVING the problems that arise when loose salt is used in unit coolers, cold air diffusers, and spray deck refrigeration, International Salt Company, Inc., Scranton, Pa., has developed a special, heavily compressed salt cube called a Sterling Kooler Kube to provide an economical and efficient method for continuously restrengthening brine and to make it easy to maintain brine at the proper Salometer reading. Meat packers, brewers, fruit storage plants and many other refrigerating plants use such brine equipment.

In addition, the new cubes tend to eliminate the expense and the trouble caused by clogging of spray nozzles, help eliminate fog in chill rooms, and save money by making possible other economies. The salt cubes have been tested successfully in a number of plants the manufacturers report.

In most plants where loose salt is used in unit coolers, it is dumped at intervals into the pan of each cooler. This sudden addition of salt, of course, creates wide fluctuations in brine strength. In contrast the highly compressed salt cubes dissolve at an even rate so the brine is continually restrengthened. Loss of strong brine in the overflow is thus avoided.

The practice of adding loose salt to the trough has another disadvantage, it adds impurities to the system, unless the brine is filtered. In many plants that use loose salt in this way the coolers, if they are to be operated at maximum efficiency, must be shut down regularly while the spray nozzles are taken apart and cleaned. Because Kooler Kubes are made of compressed salt of high purity, they produce a clear brine the manufacturers declare.

Further savings are claimed because bulk handling of salt brings losses from spilling, broken packages and other sources. In addition to this, less salt is lost in overflow brine when the brine is held at the proper Salometer degree reading. A 10 degree Salometer jump raises this loss approximately 12 percent. For this reason, continuous brine strengthening and use of the weakest possible brine effect a considerable saving in salt costs.

The salt is easy to handle and stack well. Most plants keep a supply beside the unit coolers, where they take up very little space. Each cube weighs 50 pounds and has hand grips molded into the sides for easy handling.

In changing over to Kooler Kubes, plants follow a simple formula to determine how many to use. Since each block contains 50 pounds of tightly compressed salt, the operator merely puts two of them in each cooler that had been using 100 pounds of salt a day, and replaces them as required.

Automatic Plate Freezer

TWO Knowles Automatic Package Freezers have been installed by the Belt-Ice Corporation, Seattle, in the plant of the Evergreen Frozen Foods Company, Snohomish, Washington. The two machines with the automatic loading mechanism were installed for the pea freezing season and have been operating since July 5.

The material to be frozen is supplied to the automatic freezers by a conveyor coming directly from the packaging and wrapping machine. The packages pass between moving refrigerated plates and are returned to a second conveyor when frozen. The second conveyor in turn delivers the frozen packages to the casing crew. One operator is required for the two machines. Each machine has a capacity for 1400 twelve ounce packages in the freezing cycle.

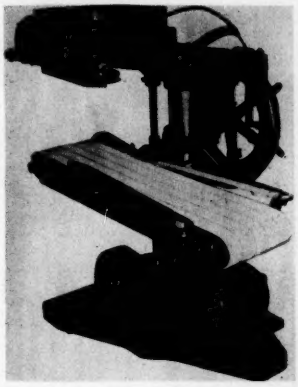
The present model machines are loaded and unloaded at the rate of 50 packages per minute each. It is however possible to load and unload each machine at the rate of 100 packages per minute. It is expected that one operator will handle four or five of these freezing units with a capacity of well over two tons hourly. The operator's duty on the present machines is to check the delivery conveyor and push the control button which sets the freezing machine in motion.

Refrigerant to the freezers is gravity feed ammonia, each machine being equipped with a small accumulator and automatic float control.

The discharge end of the automatic freezer. A row of 12 packages is emerging upon the sloping apron to the discharge conveyor.

New Bag Closing Machine

QUANTITY production of a completely automatic bag closing machine capable of closing up to 2000 paper bags per hour, is announced by the Hamer Machine Co. Described as the only fully automatic machine of this type, requiring no attendant, it is designed for low-cost, mass production packaging of bags weighing from two to one-hundred pounds when filled. It is suited for tying packaged ice containers.



New bag closing machine made by Hamer Machine Co.

An arrangement of chain drives compresses neck of bag, then seals it with 12, 14 or 15-gauge metal wire. The unit is powered by a one-half or one hp electric motor (Optional). Bags tied by the machine, the manufacturer claims, are neater, more uniform, and will not break open under repeated jolts in shipment. Potatoes, feeds, chemicals, etc., are packaged

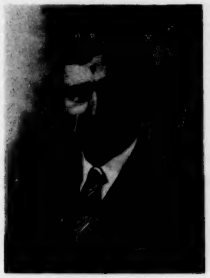
with equal ease, and even powder-fine materials cannot seep through the ring-sealed top.

Said to be an extremely flexible unit, the Minneapolis Bag Closing Machine can be added to existing facilities or easily adapted to a wide variety of individually engineered conveyor installations. Standard conveyor, which carries bags to the tying mechanism, is 41 inches long, 9 inches wide, and can be raised vertically from a point 19 inches above the floor to a maximum height of 30 inches. Other sized conveyor and belt feeder installations can be built to individual specifications.

MANUFACTURERS' NEWS

New Piston Ring Company Announced

THE establishment earlier this year of a new piston ring manufacturing firm in Fort Worth, Texas, is announced by Wm. S. Baker, designer and manufacturer of industrial piston



Wm. S. Baker

rings. The new firm, headed by Baker, is known as the Safety Seal Piston Ring Company. Associated in the business are Baker's two sons, Weldon Baker, as sales manager, and Don Baker, as assistant sales manager. Offices of the company are located at 2800 West Lancaster, in Fort Worth.

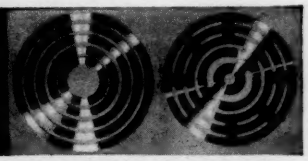
The father and sons team brings to the business a great wealth of piston ring know-how. Wm. S. Baker is a mechanical engineer and former railway master mechanic. During the past 33 years Mr. Baker has been responsible for the invention and development of four major improvements in piston rings for industrial applications, including the first practical one-piece sealing ring. For a number of years he served as chief engineer with the Double Seal Ring Co., before leaving that firm two years ago to set up his own organization. Both Weldon and Don Baker have had many years experience in the manufacturing and application of industrial piston rings.

The Safety Seal Piston Ring Company is specializing in the manufacture of the Safety Seal ring, a single-piece sealing ring, the fourth major piston ring improvement to be developed by Wm. S. Baker. The Safety Seal ring, Mr. Baker says, is the successful result of many years of work to develop a really safe and highly efficient sealing ring capable of handling present day requirements of higher compression and firing pressures in the latest type internal combustion engines and also the increased demand for efficiency in all types of compressors.

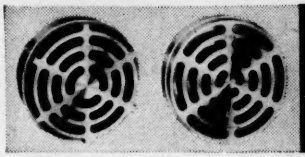
How to HOLD INSULATION on a WOOD WALL and CONCRETE FLOOR

See Page 59

Compressor Efficiency



has no equal in the race for greater output



VOSS VALVES have no equal

for they assure maximum compressor efficiency

It is a matter of record that everytime an ordinary compressor valve is replaced with a specially designed VOSS valve, the immediate result is increased efficiency and greater output . . . and this record covers thousands of installations, as letters and reports testify.

VOSS VALVES and PLATES are made to specifications for all types of air, gas and ammonia compressors; from 1 to 16" in diameter and for pressures from 3 to 4,000 pounds and for speeds from 110 to 1750 rpm.

VOSS VALVES and PLATES are NOT STAMPED; they are milled and machined for perfect fit; of finest heat treated alloyed steels; they are ductile; resist fracture, high temperatures and corrosion; withstand fatigue; won't work-harden, chip, splinter, crack or score cylinder walls.

INCREASE EFFICIENCY AND OBTAIN GREATER OUTPUT . . . send us the name, bore, stroke and speed of your compressors. Our detailed proposal will be sent without obligation.

VOSS VALVES and PLATES ASSURE

- Quiet, vibration-free operation
- 20 to 60% more valve area
- Less power consumption
- Low pressure loss
- Normal discharge temperature
- Lower operating costs
- 35% more work

J.H.H. VOSS VALVES REG. U.S. PAT. OFF.

J. H. H. VOSS CO. INCORPORATED

783 EAST 144th STREET, NEW YORK 54, N. Y.

There are two important differences between the new Safety Seal ring and all older types of sealing rings, Mr. Baker claims. It is engineered for pressure-balanced circularity, which means the sealing member is so designed that outward pressure against the cylinder wall is controlled in such a way that excessive pressures are avoided. With correct and uniform ring-to-cylinder wall pressure maintained at every point around the diameter of the ring, the possibility of scoring and uneven wear on the cylinder liner is thus eliminated. Another advantage is that the sealing member is permanently bonded to the main body of the ring throughout the entire area of contact, instead of only at the base, as in older types of sealing rings. This improved construction prevents vibration of the sealing member, and eliminates the danger of its working loose from the bond and falling into the cylinder, it is explained.

In addition to Safety Seal rings manufactured in sizes from 1 to 30 in. in diameter, the company is producing practically all other types of industrial piston rings, including plain rings and oil rings, required by stationary units, railway locomotives, and marine equipment.

Easier and Cheaper with

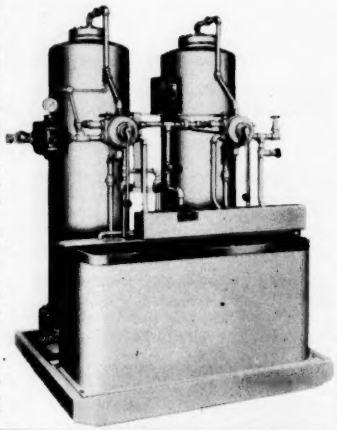
INDUSTRIAL Water Demineralizer

It's worth looking into . . .

The demineralization of water is not something new. It is used in the food industry, in the chemical and other industrial processing where chemically pure water is used in quantity. The very low cost warrants your looking into it.

Here are some of the advantages you get with an INDUSTRIAL demineralizer in ice making. Since the dissolved mineral salts in ordinary water are removed in passing through the ion-exchange resins, core-water removal and replacement is unnecessary. Losses due to cracking are greatly reduced. Freezing at the lower brine temperature increases daily yield. And the bulk of the cake of ice is clearer—your customers will notice that.

If you will send us an analysis of the water you are using, the quantity you need, and at what rate (gallons per hour) we will send you information on INDUSTRIAL demineralizers, estimate of costs, performance data, etc. Better do it now.



A typical two-bed INDUSTRIAL Water Demineralizer. Standard models available with capacities up to 1000 gph. Special units of any capacity engineered to requirements.

FILTERS Pressure Type · PUMPS Centrifugal · CORROSION TESTING APPARATUS Salt Fog • Humidity

INDUSTRIAL FILTER & PUMP MFG. CO.

5914 Ogden Avenue
Chicago 50, Illinois

RUBBER DIVISION Vulcanized Linings • Molded Products · WATER DEMINERALIZERS

Smith Resigns As Baker President

AMERICAN Wheelabrator & Equipment Corporation, owner of Baker Refrigeration Corporation, through Mr. Otto A. Pfaff, President of American Wheelabrator & Equipment Corporation, has announced the resignation of Frederick W. Smith as President of Baker Refrigeration Corporation and Manager of Baker Manufacturing Division of American Wheelabrator & Equipment Corporation. While Mr. Smith will be engaged in other business, he will continue to serve Baker Refrigeration Corporation as a consultant and as a member of its board of directors.

Mr. Pfaff was elected president of Baker Refrigeration Corporation to succeed Mr. Smith. At the same time, Charles N. Bellm was elected executive vice-president of the corporation, Mark Mooney was elected a vice-president and manager of sales and Charles Marshall vice-president and contract production manager.

No alterations in Baker's manufacturing or distributing programs are involved in the organizational changes which have taken place, although it is anticipated that, as a result of the election of Mr. Pfaff as president of Baker Refrigeration Corporation, the operations of the company will be more closely integrated with those of American Wheelabrator & Equipment Corporation than heretofore.

CATALOGS and BULLETINS

Frick Catalog Describes Valves and Fittings

A CATALOG on valves and fittings for ammonia Freon-12 and Freon-22 has been issued by The Frick Co., Waynesboro, Pa. Each part, the description states, is interchangeable with other similar parts, the work being done largely by automatic machines and being checked to standard gauges. The completed valves and fittings are tested with 300 pounds of air pressure, under water. Illustrations show construction details and various tables give specifications for various sizes and styles.

How to HOLD INSULATION on a WOOD WALL and CONCRETE FLOOR

See Page 59

QUALITY COILS FOR *ALL* APPLICATIONS

WELDED HEADERS, PIPE BENDS AND AMMONIA RECEIVERS

Whether your next job be for a single bend, or coil or complete Piping system, Chicago Nipple can supply your requirements. Experienced workmen, practical engineers, and modern equipment reflect the quality of our products.

Coils are of selected ammonia pipe—all joints are electrically welded—checked under water with an air pressure of 300 pounds to guarantee tightness.

SEND DRAWING OR BLUE PRINT FOR QUOTATION

CHICAGO NIPPLE MFG. CO.
1997 Clybourn Ave., Chicago 14, Ill.

ARMSTRONG PURGER CUTS REFRIGERATING POWER COSTS $250.00 a MONTH

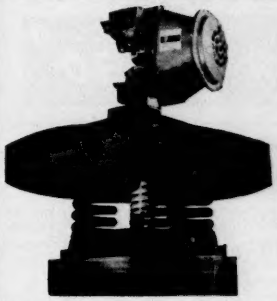
at Planters Nut & Chocolate Co.
Suffolk, Virginia

AIR and other non-condensables no longer cause excess refrigerant system head pressures at this plant. An Armstrong Purger has lowered it 20 lbs. with power savings estimated at $250 per month. Other benefits: 5% increase in compressor capacity, savings in refrigerant, water, and work.

Check your system for excess head pressures. If it's high you have a real opportunity for savings with the Armstrong Purger. Bulletin 192 gives details. Write:

ARMSTRONG MACHINE WORKS
860 Maple Street • Three Rivers, Michigan

ARMSTRONG Forged Steel PURGER



DON'T LOOSE YOUR HEAD!

Use— Safety Head Control

No Compressor Destroys Itself Without First Raising It's Own Head

The Automatic Safety Head Control may be applied to any vertical refrigeration compressor that has a safety head. The Safety Control is operated by the lifting of the safety head as a result of broken valve or screw, carbon build-up, loose connecting rod, or a slug of liquid.

As the safety head lifts, a stainless steel push rod operates a micro-switch which may be connected to the main power control and also through the liquid line solenoid and an alarm system.

Compressors with Safety Head Controls installed are protected against blown out heads. Packing around the push rod is special high temperature and high pressure V-type.

Representatives Wanted

Write for Bulletin

SAFETY HEAD CONTROL CO.
3759 S. Damen Ave. Chicago 9, Illinois

NOZZLES • DROP TUBES • CAN DOGS • CAN FILLERS • BLOWERS • BRACKETS • BAGS • HOISTS

• ICE CRUSHERS •

CLEAR RAW WATER AIR AGITATION SYSTEMS
REPLACEMENT PARTS — ICE CRUSHING EQUIPMENT
ICE SIZING EQUIPMENT — ICE DELIVERY EQUIPMENT
ICE HANDLING EQUIPMENT
PROMPT DELIVERIES — LOW PRICES

ICE PLANT EQUIPMENT CO., Inc.

WRITE OR TELEGRAPH **2543 Frankford Ave.** **Philadelphia 25, Pa.** TELEPHONE NEbraska 4-3055

• RUBBER TUBING •

TUBE CLEANERS • PUMPS • FILTERS • VALVES • ICE TONGS • THERMOMETERS • ICE PICKS

DIMCO CAST ALUMINUM FIN EVAPORATING COIL

★ *Saves Space*

★ *Saves Weight*

★ *Saves Cost*

CAN BE USED WITH ANY REFRIGERANT
SALES AGENCIES SOLICITED

Manufactured by

DETROIT ICE MACHINE COMPANY
2615 Twelfth St., Detroit 16, Mich.

DIMCO Fin Coils solve low headroom problem
View of Mezzanine Lard Storage Room
Peters Sausage Company, Detroit, Mich.

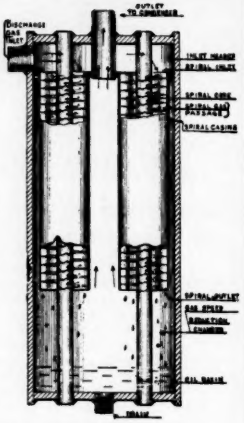
"King Zeero"

OIL SEPARATOR

STOPS OIL FROM ENTERING CONDENSER RECEIVER AND LOW SIDE

Allows operation as was originally intended. Simple in operation — no parts to wear out — no screens, metal wool or any close screens to clog, raise discharge pressures and cut down capacity.

When used in connection with air compressors, water is also separated with the oil.



Built for years of trouble free service.
Mechanical details on request.

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1447-55 Montrose Ave., Chicago 13, Ill.

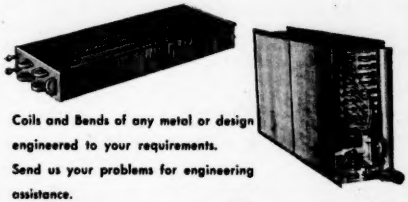
for Highest Quality

LOOK TO REMPE!

PIPE COILS • FIN COILS

For **Refrigeration, Air Conditioning, and Heating**

Rempe Coils are accepted in the industry as quality equipment that is built for long service without maintenance. Rempe Coils are used on the most difficult jobs and forgotten. This confidence has been earned the hard way—through proper engineering, good quality materials and precision manufacturing.



Coils and Bends of any metal or design engineered to your requirements. Send us your problems for engineering assistance.

REMPE CO. Heat Transfer Equipment Founded 1890

REMPE COMPANY
348 N. Sacramento Blvd., Chicago 12, Ill.

V.P.L. FOR ANY SEASON—

Varying seasonal demands require air supply according to the load. With R-C Rotary Positive Blowers, you can adjust to needed Volume at required Pressure and Low power cost. Simple in design and construction, R-C Blowers maintain V.P.L. for years of satisfaction. Ask us about your needs or write for free Bulletin 21-B-37.

Roots-Connersville Blower Corporation
510 Columbia Avenue, Connersville, Indiana

ROOTS-CONNERSVILLE BLOWER BUILDERS SINCE 1854

ONE OF THE DRESSER INDUSTRIES

THE BUYERS DIRECTORY

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Frick Co., Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

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Ice Plant Equipment Co., Inc. Philadelphia, Pa.

AIR COMPRESSORS
Frick Co., Waynesboro, Pa.

AIR CONDITIONING EQUIPMENT
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Niagara Blower Co., New York, N.Y.

AMMONIA COMPRESSOR VALVES
Frick Co., Waynesboro, Pa.

AMMONIA COMPRESSORS
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AMMONIA MANUFACTURERS
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Barrett Div., The, Allied Chemical & Dye Corp., New York, N. Y.
Bower Chemical Mfg. Co., Henry Philadelphia, Pa.
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AMMONIA PURIFIERS
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Creamery Package Mfg. Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Kehoe Machinery Co., Inc., R. F., Ridgefield Park, N. J.
National Pipe Bending Co., New Haven, Conn.
Rempe Company, Chicago, Ill.
Reynolds Mfg. Co., Springfield, Mo.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

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Shank Co., Cyrus, Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

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Ophuls & Associates, Fred, New York, N. Y.

ASPHALT PRODUCTS
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AUTOMATIC CONTROL DEVICES
Alco Valve Co., St. Louis, Mo.
Armstrong Machine Works, Three Rivers, Mich.
Frick Co., Waynesboro, Pa.
Phillips & Co., H. A., Chicago, Ill.
Rex Engineering & Sales Co., Oklahoma City, Okla.
Vilter Mfg. Co., Milwaukee, Wis.

BAGS, ICE
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International Paper Co., New York, N. Y.
Union Bag & Paper Corp., New York, N. Y.
United Ice & Oil Supply Co., Boston, Mass.

BAGS, WATERPROOF PAPER
Index Coupon & Supply Co., La Porte, Ind.
International Paper Co., New York, N. Y.
Union Bag & Paper Co., New York, N. Y.

BEER COOLERS
Frick Co., Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

BLOWERS
Frick Co., Waynesboro, Pa.
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BOILER TUBES
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Reynolds Mfg. Co., Springfield, Mo.
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BRINE COOLERS
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Frick Co., Waynesboro, Pa.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
Reynolds Mfg. Co., Springfield, Mo.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

BRINE SPRAY COOLING
Acme Industries, Inc., Jackson, Mich.
Frick Co., Waynesboro, Pa.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.

CALCIUM CHLORIDE
Solvay Sales Div., Allied Chem. & Dye Corp., New York, N. Y.

CAN DUMPS
Frick Co., Waynesboro, Pa.
Gifford-Wood Co., Hudson, N. Y.
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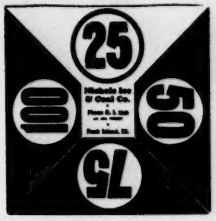
WEATHERPROOFED ICE SIGNAL CARDS

Coated Both Sides With Paraffine

ANY COLOR



ANY SIZE

We Make Any Design of Ice Signal Card

Send In Your Individually Designed Cards for Quotation

Write for Ice Signal Card Circular and Prices

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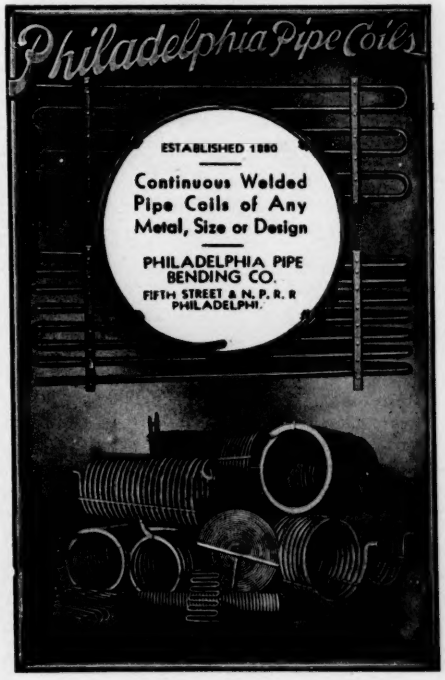
LaPorte, Indiana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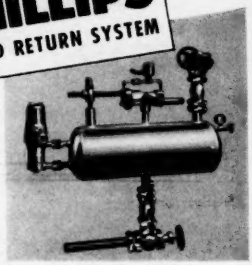
ESTABLISHED 1880
Continuous Welded Pipe Coils of Any Metal, Size or Design
PHILADELPHIA PIPE BENDING CO.
FIFTH STREET & N. P. R. R
PHILADELPHI

for Complete
COMPRESSOR PROTECTION
install a **PHILLIPS** LIQUID RETURN SYSTEM



- **SAFEGUARDS** Ammonia Compressors
- **ASSURES** Economical Operation with Full-flooded Coils

Here's the proved method of protecting ammonia compressors from the damages of liquid slop-over. Phillips Liquid Return Systems effectively return refrigerant liquid from a suction line trap to the liquid receiver or liquid line—and, effect savings in operation. With a Phillips System, full flooding of coils is possible for maximum efficiency of evaporation and properly-conditioned suction gases are assured.

PHILLIPS FLOAT CONTROLS
For "Freon"—1 to 1000 Ton Cap
For Ammonia—1 to 2000 Ton Cap

Several types of systems are available: for Gravity, Injection Lift and Pressure Lift operation, in sizes up to 1000 tons. A Phillips Engineer will gladly help to select the right one to assure complete protection for you. Write today for full information in Bulletin LRS-50.

H. A. PHILLIPS & CO. DESIGNERS AND ENGINEERS REFRIGERATION CONTROL SYSTEMS
3255 W. CARROLL AVENUE • CHICAGO 24, ILLINOIS

Your Assurance of Best Quality
REFRIGERATION COILS
made by The National
PIPE BENDING COMPANY

All features that you demand are furnished regularly in National Pipe Bending Refrigeration coils—smooth bends, perfect welds, measurements exact.

For long service, specify coils by the National
Pipe Bending Co.
Established 1883
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THE BUYERS

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Howe Ice Machine Co., Chicago, Ill.
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Vogt Machine Co., Henry, Louisville, Ky.

COLD STORAGE CONSTRUCTION
Armstrong Cork Co., Lancaster, Pa.
Frick Co., Waynesboro, Pa.

COLD STORAGE DOORS
Butcher Boy Cold Storage Door Co., Chicago, Ill.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Jamison Cold Stge. Door Co., Hagerstown, Md.
Refrigeration Engineering Co., Montgomery, Minn.

COMPRESSORS
(See Ice Making and Refrigerating Machinery)

COMPRESSOR VALVE PLATES AND DISCS
Voss, Inc., J. H. H., New York, N.Y.

COMPRESSOR VALVES
Voss, Inc., J. H. H., New York, N.Y.

CONDENSERS
Acme Industries, Inc., Jackson, Mich.
Creamery Package Mfg. Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
King-Zeero Co., Chicago, Ill.
National Pipe Bending Co., New Haven, Conn.
Philadelphia Pipe Bending Co., Philadelphia, Pa.
Rempe Company, Chicago, Ill.
Reynolds Mfg. Co., Springfield, Mo.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

CONSULTING ENGINEERS
Greene, Van R. H., New York, N. Y.
Ophuls & Associates, Fred, New York, N. Y.

CONTROLLNG INSTRUMENTS
Taylor Instrument Companies, Rochester, New York

CONVEYORS
Capital Elevator & Mfg. Co., Columbus, Ohio
Conveyor Co., The, Los Angeles, Calif.
Gifford-Wood Co., Hudson, N. Y.
Lilly Co., The, Memphis, Tenn.

COOLING TOWERS
Frick Co., Waynesboro, Pa.
Vilter Mfg. Co., Milwaukee, Wis.

CORK INSULATION
Armstrong Cork Co., Lancaster, Pa.
Luse-Stevenson Co., Inc., Chicago, Ill.

CORROSION CONTROL
Wright Chemical Control Corp., Chicago, Ill.

COUPON BOOKS
Index Coupon & Supply Co., La Porte, Ind.
United Ice & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

COVERINGS (PIPE AND BOILERS)
American Hair & Felt Co., Chicago, Ill.
Armstrong Cork Co., Lancaster, Pa.

CYLINDERS (GAS & LIQUID)
Byers Co., A. M., Pittsburgh, Pa.

DEIONIZING EQUIPMENT
Industrial Filter & Pump Mfg. Co. Inc., Chicago, Ill.

DEMINERALIZING EQUIPMENT
Industrial Filter & Pump Mfg. Co. Inc., Chicago, Ill.

DIP TANKS AND CAN BASKETS
Frick Co., Waynesboro, Pa.
Ice Plant Equipment Co., Inc. Philadelphia, Pa.
Knickerbocker Stamping Co., Parkersburg, W. Va.
Ohio Galvanizing & Mfg. Co., Niles, Ohio
Vogt Machine Co., Henry, Louisville, Ky.

DRIVES, TRANSMISSIONS
Frick Company, Waynesboro, Pa.

ELEVATING & CONVEYING MACHINERY
Capital Elevator & Mfg. Co., Columbus, Ohio
Conveyor Co., The, Los Angeles, Calif.
Gifford-Wood Co., Hudson, N. Y.
Lilly Co., The, Memphis, Tenn.

ENGINEERS AND ARCHITECTS
(See Architects and Engineers)

EVAPORATIVE CONDENSERS
Niagara Blower Co., New York, N.Y.

EVAPORATORS
Acme Industries, Inc., Jackson, Mich.
Creamery Package Mfg. Co., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Niagara Blower Co., New York, N.Y.
Rempe Company, Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

FEED-WATER HEATERS
National Pipe Bending Co., New Haven, Conn.
Vogt Machine Co., Henry, Louisville, Ky.

FIBERGLAS
Armstrong Cork Co., Lancaster, Pa.

FIELD ICE SAWS
Gifford-Wood Co., Hudson, N. Y.
United Ice & Oil Supply Co., Boston, Mass.

FILTERS, CLARIFYING
Industrial Filter & Pump Mfg. Co., Inc., Chicago, Ill.

FILTERS, WATER
Frick Co., Waynesboro, Pa.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Industrial Filter & Pump Mfg. Co., Inc., Chicago, Ill.

FILTRATION EQUIPMENT
Industrial Filter & Pump Mfg. Co., Inc., Chicago, Ill.

FIN COILS
Acme Industries, Inc., Jackson, Mich.
Howe Ice Machine Co., Chicago, Ill.
Rempe Company, Chicago, Ill.

DIRECTORY

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FITTINGS
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Henry Valve Co., Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

FLOAT VALVES
Mojonnier Bros. Co., Chicago, Ill.

FOOD FREEZING EQUIPMENT
Howe Ice Machine Co., Chicago, Ill.

FROZEN FOOD LOCKERS
Knickerbocker Stamping Co., Parkersburg, W. Va.

FUEL OIL PRE-HEATERS
National Pipe Bending Co., New Haven, Conn.
Rempe Company, Chicago, Ill.

HAND TRUCKS
Ohio Galvanizing & Mfg. Co., Niles, Ohio

HOISTING APPARATUS
Capital Elevator & Mfg. Co., Columbus, Ohio
Conveyor Co., The, Los Angeles, Calif.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Reynolds Mfg. Co., Springfield, Mo.

HUMIDITY AIR CONDITIONERS
Niagara Blower Co., New York, N.Y.

HYGROMETERS
Taylor Instrument Companies, Rochester, N. Y.

ICE BAGS
International Paper Co., New York, N. Y.
Union Bag & Paper Corp., New York, N. Y.

ICE BLOWERS
Conveyor Co., The, Los Angeles, Calif.
Gifford-Wood Co., Hudson, N. Y.

ICE CANS
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
Knickerbocker Stamping Co., Parkersburg, W. Va.
Ohio Galvanizing & Mfg. Co., Niles, Ohio

ICE CAN FILLERS
Frick Co., Waynesboro, Pa.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Knickerbocker Stamping Co., Parkersburg, W. Va.
Ohio Galvanizing & Mfg. Co., Niles, Ohio
Vogt Machine Co., Henry, Louisville, Ky.

ICE CHIPPERS
Capital Elevator & Mfg. Co., Columbus, Ohio
Gifford-Wood Co., Hudson, N. Y.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Index Coupon & Supply Co., La Porte, Ind.
United Ice & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE CHUTES
Conveyor Co., The, Los Angeles, Calif.
Frick Co., Waynesboro, Pa.
Gifford-Wood Co., Hudson, N. Y.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Jamison Cold Storage Door Co., Hagerstown, Md.

ICE CONVEYORS
Capital Elevator & Mfg. Co., Columbus, Ohio
Conveyor Co., The, Los Angeles, Calif.
Gifford-Wood Co., Hudson, N. Y.
Lilly Co., The, Memphis, Tenn.
Refrigeration Engineering Co., Montgomery, Minn.
United Ice & Oil Supply Co., Boston, Mass.

ICE CREAM PLANTS
Frick Co., Waynesboro, Pa.

ICE CRUSHERS
Bateman Foundry & Machine Co., Inc., Mineral Wells, Texas
Conveyor Co., The, Los Angeles, Calif.
Gifford-Wood Co., Hudson, N. Y.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Index Coupon & Supply Co., La Porte, Ind.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
Lilly Co., The, Memphis, Tenn.
Tri-Pak Machinery Service Inc., Harlingen, Tex.
United Ice & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE CUBE CONTAINERS
Index Coupon & Supply Co., La Porte, Ind.
International Paper Co., New York, N. Y.
Lilly Co., The, Memphis, Tenn.
Union Bag & Paper Co., New York, N. Y.
United Ice & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE CUBERS
Vivian Mfg. Co., St. Louis, Mo.

ICE CUBING MACHINES
Gifford-Wood Co., Hudson, N. Y.
Ice Plant Equipment Co., Inc. Philadelphia, Pa.
Lilly Co., The, Memphis, Tenn.
United Ice & Oil Supply Co., Boston, Mass.

ICE DELIVERY BAGS
Gifford-Wood Co., Hudson, N. Y.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Index Coupon & Supply Co., La Porte, Ind.
International Paper Co., New York, N. Y.
Lilly Co., The, Memphis, Tenn.
Union Bag & Paper Corp., New York, N. Y.
United Ice & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE HARVESTING MACHINERY & TOOLS
Gifford-Wood Co., Hudson, N. Y.
United Ice & Oil Supply Co., Boston, Mass.

ICE MAKING AND REFRIGERATING MACHINERY
Creamery Package Mfg. Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Detroit Ice Machine Co., Detroit, Mich.
Enterprise Equipment Corp., Yonkers, N. Y.
Frick Company, Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Ice Plant Equipment Co., Inc. Philadelphia, Pa.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
Reynolds Mfg. Co., Springfield, Mo.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

ICE PICKS
Conveyor Co., The, Los Angeles, Calif.

ICE PICKS AND PLANERS
Conveyor Co., The, Los Angeles, Calif.
Gifford-Wood Co., Hudson, N. Y.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Index Coupon & Supply Co., La Porte, Ind.
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United Ice & Oil Supply Co., Boston, Mass.
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(Buyers Directory continued on next page)

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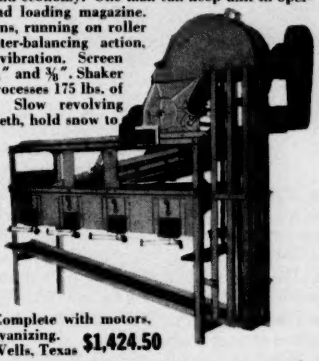

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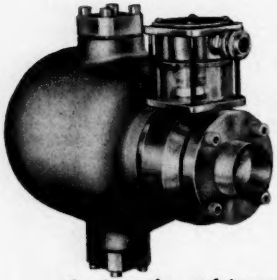

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ICE PICK SCABBARDS
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Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Index Coupon & Supply Co., La Porte, Ind.
United Ice & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE PICK VENDING MACHINES
United Ice & Oil Supply Co., Boston, Mass.

ICE PLANTS
Enterprise Equipment Corp., Yonkers, N. Y.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.

ICE SCALES
Conveyor Co., The, Los Angeles, Calif.
Gifford-Wood Co., Hudson, N. Y.
Index Coupon & Supply Co., La Porte, Ind.
Lilly Co., The, Memphis, Tenn.
United Ice & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE SHAVERS
Conveyor Co., The, Los Angeles, Calif.

ICE TOOLS
Conveyor Co., The, Los Angeles, Calif.
Gifford-Wood Co., Hudson, N. Y.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Index Coupon & Supply Co., La Porte, Ind.
Lilly Co., The, Memphis, Tenn.
United Ice & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

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Taylor Instrument Companies, Rochester, New York

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Frick Company, Waynesboro, Pa.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Jamison Cold Storage Door Co., Hagerstown, Md.
Refrigeration Engineering Co., Montgomery, Minn.
S & S Vending Machine Co., San Jose, Calif.
United Ice & Oil Supply Co., Boston, Mass.

INSTANTANEOUS HEATERS
National Pipe Bending Co., New Haven, Conn.

INSULATING MATERIALS
American Hair & Felt Co., Chicago, Ill.
Armstrong Cork Co., Lancaster, Pa.
Ruse-Stevenson Co., Inc., Chicago, Ill.
Pacific Lumber Co., San Francisco, Calif.

INSULATION ADHESIVES
American Bitumuls & Asphalt Co. San Francisco, Calif.

LOW TEMPERATURE EQUIPMENT
(See Ice Making and Refrigerating Machinery)

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Mojonnier Bros. Co., Chicago, Ill.

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Ohio Galvanizing & Mfg. Co., Niles, Ohio

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Socony-Vacuum Oil Co., Inc., New York, N. Y.
Texas Co., The, New York, N. Y.

OIL SEPARATORS
King-Zeero Co., Chicago, Ill.
Rex Engineering & Sales Co., Oklahoma City, Okla.

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Socony-Vacuum Oil Co., Inc., New York, N. Y.
Texas Co., The, New York, N. Y.

OILS, FUEL
Socony-Vacuum Oil Co., Inc., New York, N. Y.
Texas Co., The, New York, N. Y.

PACKINGS
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Vivian Mfg. Co., St. Louis, Mo.

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Acme Industries, Inc., Jackson, Mich.
Chicago Nipple Mfg. Co., Chicago, Ill.
Frick Company, Waynesboro, Pa.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
National Pipe Bending Co., New Haven, Conn.
Philadelphia Pipe Bending Co., Philadelphia, Pa.
Rempe Company, Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

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Acme Industries, Inc., Jackson, Mich.
National Pipe Bending Co., New Haven, Conn.
Philadelphia Pipe Bending Co., Philadelphia, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

PIPING
Acme Industries, Inc., Jackson, Mich.
Byers Co., A. M., Pittsburgh, Pa.
Frick Company, Waynesboro, Pa.
National Pipe Bending Co., New Haven, Conn.
Philadelphia Pipe Bending Co., Philadelphia, Pa.
Rempe Company, Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

PISTON RINGS
Safety Seal Piston Ring Co., Ft. Worth, Texas

PRESSURE BLOWERS
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Roots-Connersville Blower Corp., Connersville, Ind.

PRESSURE REGULATORS
Taylor Instrument Companies, Rochester, N. Y.

PROPELLERS
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PROTECTIVE DEVICES
Safety Head Control Co., Chicago, Ill.

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Aurora Pump Co., Aurora, Ill.
Deming Co., The, Salem, Ohio
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Layne & Bowler, Inc., Memphis, Tenn.
Roots-Connersville Blower Corp., Connersville, Ind.

PUMPING MACHINERY—AIR LIFT
Deming Co., The, Salem, Ohio
Roots-Connersville Blower Corp., Connersville, Ind.

PUMPS, AMMONIA AND BRINE
Deming Co., The, Salem, Ohio
Frick Company, Waynesboro, Pa.
Roots-Connersville Blower Corp., Connersville, Ind.
Vogt Machine Co., Henry, Louisville, Ky.

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Aurora Pump Co., Aurora, Ill.
Deming Co., The, Salem, Ohio
Layne & Bowler, Inc., Memphis, Tenn.

PUMPS, ROTARY
Aurora Pump Company, Aurora, Ill.
Deming Co., The, Salem, Ohio
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Roots-Connersville Blower Corp., Connersville, Ind.

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Frick Company, Waynesboro, Pa.
Rex Engineering & Sales Co., Oklahoma City, Okla.

RAW WATER FREEZING SYSTEMS
Frick Co., Waynesboro, Pa.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

REBOILERS
Frick Company, Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

RECORDING THERMOMETERS
Taylor Instrument Companies, Rochester, New York

REFRIGERATED ICE STATIONS
Refrigeration Engineering Co., Montgomery, Minn.
S & S Vending Machine Co., San Jose, Calif.

REFRIGERATING AND ICE MAKING MACHINERY
(See Ice Making and Refrigerating Machinery)

RUST PREVENTATIVES
Bower Chemical Mfg. Co., Henry Philadelphia, Pa.

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Safety Head Control Co., Chicago, Ill.

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Frick Company, Waynesboro, Pa.
Gifford-Wood Co., Hudson, N. Y.
Lilly Co., The, Memphis, Tenn.
Perfection Ice Scoring Machine Co., Fort Worth, Texas
United Ice & Oil Supply Co., Boston, Mass.

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Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
United Ice & Oil Supply Co., Boston, Mass.

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King-Zeero Co., Chicago, Ill.
National Pipe Bending Co., New Haven, Conn.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

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Gifford-Wood Co., Hudson, N. Y.
Index Coupon & Supply Co., La Porte, Ind.
Lilly Co., The, Memphis, Tenn.
United Ice & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

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Bateman Foundry & Machine Co., Inc., Mineral Wells, Texas
Gifford-Wood Co., Hudson, N. Y.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Lilly Co., The, Memphis, Tenn.
Vivian Mfg. Co., St. Louis, Mo.

SPRAY NOZZLES
Ice Plant Equipment Co., Inc., Philadelphia, Pa.

STORAGE HEATERS
National Pipe Bending Co., New Haven, Conn.

STRAINERS
Ice Plant Equipment Co., Inc., Philadelphia, Pa.

TANKS
Frick Company, Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

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Ice Plant Equipment Co., Inc. Philadelphia, Pa.
Index Coupon & Supply Co., La Porte, Ind.
Lilly Co., The, Memphis, Tenn.
United Ice & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

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Ice Plant Equipment Co., Inc. Philadelphia, Pa.
Taylor Instrument Companies, Rochester, New York

THERMOMETERS, RECORDING
Taylor Instrument Companies, Rochester, New York

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Capital Elevator & Mfg. Co., The, Columbus, Ohio
Gifford-Wood Co., Hudson, N. Y.

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Armstrong Machine Works, Three Rivers, Mich.
Rex Engineering & Sales Co., Oklahoma City, Okla.

UNIT COOLERS
Acme Industries, Inc., Jackson, Mich.
Howe Ice Machine Co., Chicago, Ill.
Niagara Blower Co., New York, N.Y.
Rempe Company, Chicago, Ill.

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Enterprise Equipment Corp., Yonkers, N. Y.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.

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Alco Valve Co., St. Louis, Mo.
Frick Company, Waynesboro, Pa.
Henry Valve Co., Chicago, Ill.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
Phillips & Co., H. A., Chicago, Ill.
Shank Co., Cyrus, Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

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Voss, Inc., J. H. H., New York, N.Y.

WATER COOLERS
Acme Industries, Inc., Jackson, Mich.
Niagara Blower Co., New York, N.Y.
Vogt Machine Co., Henry, Louisville, Ky.

WATER TREATMENT MATERIALS
Industrial Filter & Pump Mfg. Co. Inc., Chicago, Ill.

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Frick Company, Waynesboro, Pa.
Philadelphia Pipe Bending Co., Philadelphia, Pa.
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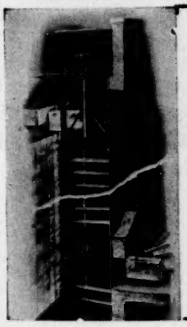

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Item No.

1—4x4 York, 300 RPM 16
6—6x6 York's, 200 RPM 20
1—6x6 Frick, 257 RPM 21
2—6x6 York's, 400 RPM, forced-feed lubrication 25
2—6½x6½ Arctics, 350 RPM, forced feed lub. 30
1—7¼x7¼ Baker, 350 RPM, forced feed lubrication 35
1—7x7 Frick, 200 RPM 40
1—7½x7½ York, 200 RPM 51
2—7½x7½ Yorks, 350 RPM, forced-feed lubrication 54
1—7½x7½ York, 400 RPM, forced-feed lub. Late Type 55
1—8x8 Frick, 400 RPM forced feed lub. V-belt wheel 57
1—8x8 York, 400 RPM, forced feed lub., V-belt wheel 58
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1—9x9 York, 200 RPM 71
1—9x9 Worthington, 325 RPM, forced feed lub. 72
1—10x10 De La Vergne, 360 RPM, forced feed lub. 73
1—10x10 York, 257 RPM, forced feed lub. 80

Item No.

1—10x10 Carbondale, 100 HP synch. motor, 350 RPM 81
3—10x10 York's, 225 RPM, semi-forced feed lub. 82
1—10x10 Frick, direct connected 100 HP Sync. Motor 84
1—10x10 York, direct connected 100 HP Sync. Motor 86
1—11x13 York, 164 RPM, forced feed lub. 90
2—12x12 Frick, direct conn. 150 HP synch. motor 98

Diesel Driven and Diesel Engines

1—8x8 York—Direct connected to 50 HP Fairbanks-Morse at 257 RPM 210

Steam Driven

1—8x8 Vertical York, 300 RPM direct connected 327

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Complete Ice Plants

1—15-ton electric driven plant 630
6—50-Ton Ice Plants, 10 can pull complete 631
Brand New 8 to 10-ton Clear Ice-Making Plants—110 Cans—Electric or Diesel Drive—2 Can Pull 632

Item No.

1—*247 Can, 22-ton ice plants, like new* 632A
1—35-38 ton New Clear Ice Making Plants 635
1—150 Ton Multi lift—1622 Can Plant 636
1—702 Can Plant—9 Can Pull 637
1—920 Can Plant—12 Can Pull 638
1—150 Ton Ice Plant—2 Tank 660

Traveling Cranes

2—4 Ton Overhead Traveling Cranes. 9 & 12 Can Grid.

Self-Contained Units

3—4x4 York & Fricks 742
1—5x5 York—390 RPM 743
1—4½x5 Lipman—360 RPM 744
1—3x3 Worthington 748
1—5x5 Frick—Forced Feed—400 RPM Latest Type 758

Used Ice Cubers

1—300 lb. ULINE, fully automatic cuber 501
1—50 lb. F & E Safety Cuber 502

Condensers

3—100 ton shell and tube condensers retubed 919
1—125-ton, Vertical Shell & Tube, 196 2" tubes 921
1—120 ton, 216—2" retubed Vertical Shell & Tube 922
2—20 ton Horizontal—retubed 924

Ice Cans

4000 Cans—Like new—11"x22"x47" 950

ROBERT P. KEHOE MACHINERY CO., Inc.

REFRIGERATION EQUIPMENT

6 EUCKER STREET

RIDGEFIELD PARK, N.J.

PHONE: DIAMOND 2-8554

CABLE ADDRESS: KEHOEINC

Classified Advertising

All classified advertisements are payable in advance. Except for Positions and Help Wanted classifications, this section is reserved exclusively for USED equipment.

RATES: $3.50 for 50 words or less; 60c for each additional 10 words or fraction thereof; 75c per line for bold face headings; $8.00 per inch for line listings.

POSITIONS AND HELP WANTED

POSITION WANTED—Warehouse executive, interested in relocating. Over twenty years experience in all phases refrigerated and general merchandise warehousing. Presently employed as general manager of medium sized operation. Excellent references. Address Box JU-7, Ice and Refrigeration, 435 N. Waller Ave., Chicago 44, Ill.

POSITION WANTED—as chief engineer of a group of ice or cold storage plants, with large reputable firm. Qualified to handle all details or any condition that may arise; plant economy, maintenance, insulating, erecting, breakdowns, etc. Any size or number of plants. Member N.A.P.R.E. Best references. Address Box No. OT-5, Ice and Refrigeration, 435 N. Waller Av., Chicago 44, Ill.

ICE PLANTS—for sale

FOR SALE—Zenith 3 ton portable ice plant, with 10 ton motor and extra compressor for storage room. Can operate at present location or move. Write Zenith Ice Co., Box 414, Garden City, Kansas.

FOR SALE—25 ton ice plant located in California. Semi-automatic; many labor saving devices. Ideal set up for two operating owners. Write Box OT-6, Ice and Refrigeration, 435 N. Waller Ave., Chicago 44, Ill.

FOR SALE—approximately 50 ton raw water, electric power driven ice plant, complete; now in operation, with good territory. No other ice plant in county of 40,000 population. This plant has approximately 700 tons ice storage. Terms can be arranged. The Enterprise Ice & Coal Co., Harriman, Tenn.

FOR SALE—Complete 40 ton Frick ice plant, 2 freezing tanks, 5 compressors, automatic controls, deep well pumps, crushing and sizing equipment, automatic bender, all in excellent condition. Must be moved. Would consider exchanging machinery for some cash and stock in new corporation locating equipment in good territory. Address Box OT-3, Ice and Refrigeration, 435 N. Waller Ave., Chicago 44, Ill.

FOR SALE—12 ton ice plant complete, Snow Hill, N. C.; 15 miles from DuPont's new plant, near Kinston, N. C. Terms or cash. Make me an offer. Only plant in county; nearest plant 15 miles. Other business interests taking my time. Write R. H. Worthington, Ayden, N. Car.

USED EQUIPMENT-wanted & for sale

FOR SALE—York Corp. V.S.A. ammonia compressors; one 6½x6½, one 7½x7½, one 8x8. Also two 7x5 Pennsylvania Pump Co., air compressors. All five machines with or without motors. David Gordon, 1502 Indiana Ave., Chicago 5, Ill.

FOR SALE—New Progress refrigerators and bottle coolers below cost. Used bottle type water coolers. 2 h.p. vertical agitator—flexible coupling for Diesel and compressor 4"-4½"—¼ h.p. brine pump 220 v. 3 ph. Write Pottsville Ice Company, Pottsville, Penna.

FOR SALE

1—150 ton York ice plant, electric driven, 13 can pull, 10 yrs. old—equal to new.
1—65 ton Frick ice plant, Diesel driven, 27 can pull.
1—50 ton York ice plant, electric driven, 4 can pull (overhauled and new compressors installed 1947).
1—10x10 York ammonia compressor connected by coupling to 100 h.p., 300 r.p.m. GE synchronous motor.
1—8x8 York ammonia compressor direct connected to 50 h.p. synchronous motor.
1—7½x7½ York ammonia compressor direct connected to 40 h.p. synchronous motor. Cubing machines, scoring machines, agitators, water and brine pumps, etc.

JOHN F. CARSON
2829 N. Broad St. Philadelphia 32, Pa.
BAldwin 9-5932

USED EQUIPMENT-Continued

FOR SALE—250 ice cans—16 gauge—11x22x48/49—fair condition, $2.00 each. F.O.B. Baltimore. C. Hoffberger Company, 1517 N. Gay St., Baltimore 13, Maryland.

WANTED—Used ice plants, 5 to 100 tons. Also NH_3 highsides. Only recent manufacture. Must be priced F.O.B. RR cars. Give detailed description, no generalities. For Resale. We pay fair prices and inspect personally. Write Box OT-4, Ice and Refrigeration, 435 N. Waller Ave., Chicago 44, Ill.

COLD STORAGE EQUIPMENT

Frick 30"x16'-0", 100-ton, 80 tube vertical single pass condenser. Excellent condition, $450.00. Frick 9x9 compressor, forced feed, 190 r.p.m., good condition. Good ammonia valves, both screw and flange types, ½" to 6", at bargains. Lots of other good equipment. Tell us what you need.

AAA STEEL & SUPPLY CO.
Canton & Hawkins Sts. Dallas 1, Texas

FOR SALE—14... ton ice tank. Buyer to remove. Located at Port O'Connor, Texas. Write Port O'Connor Ice Plant, Port O'Connor, Texas.

FOR SALE—to be moved at once. One Fairbanks-Morse 120 h.p., 257 r.p.m., style VA full Diesel with all operating equipment, 40 KVA generator, exciter, switch panel, coupling, etc. Recently overhauled; presently connected to 10"x10" comp. (can be included). Lokey Ice Co., Panama City, Fla.

FOR SALE—3x3 self-contained York. 3x3, 4x4, 5x5, 6x6, 8x8 Yorks, splash lubrication. Two 25 ton shell & tube condensers. One 10 ton horizontal enclosed brine cooler. Four Acme Freon suspended type blower units. Ammonia receivers, all sizes. 2" and 3" flanged valves. Write E. Niebling, 1546 St. Clair Ave., Mt. Healthy, Cincinnati 31, Ohio.

FOR SALE—2 completely rebuilt 7x7 and 9x9 Frick compressors, high speed FF lubrication, with 40 and 75 slip ring motors and auto reduced voltage starters. 36"x15' vertical condenser, 140—2" tubes, 30"x16' vertical condenser 96—2" tubes—both retubed since used. 39"x16'0" horizontal 10 pass condenser 176—2" tubes and 46"x15'10 pass 220—2" tubes, both excellent condition. Also one 10"x16'0" receiver. Address Box OT-8, Ice and Refrigeration, 435 N. Waller Ave., Chicago 44, Ill.

FOR SALE—USED EQUIPMENT

1—35 ton York low pressure, electric drive, synchronous motor driven, 4 can lift, well pumps vertical shell & tube condenser, piping, panels complete.
3—100 ton York and Frick ice plants.
1—50 ton York ice plant.
1—70 ton Vilter ice plant.
1—200 ton York ice plant.
1—120 ton York ice plant.
1—400 ton York ice plant.
2—300# Champion ice crushers with 7½ h.p. motors, with hoppers and chutes.
1—Model F Gifford-Wood 2 way scoring machine.
1—Perfection 2 way scoring machine.
3—Tiering machines, 4-6-8 Tiers.
1—Gifford-Wood Model #560 Ice Crusher, in original crate.
1—90 ton horizontal shell and tube condenser.
500—11"x22"x47" ice cans, good condition.
500—11"x22"x50" ice cans, good condition, LIKE NEW.
1—4x6 York self-contained unit, 5 h.p.
102—Door type Master lockers, 15"x24"x30".
102—Drawer type Master lockers, 16"x24"x30".
1—Model 54-Y Creamery ice crusher, belt drive. Conveyor chain—6" pitch.
Send us your requirements on equipment you need.

UNITED SUPPLY & EQUIPMENT CO., INC.
55 Beverly Street Boston 14, Mass.

USED MACHINERY—continued

FREON COMPRESSORS

1—York D-6, 12½x9, direct connected to synchronous motor 125 h.p. 2 ph., 60 cy. 220 V. 360 r.p.m. Exciter & starting equip.
1—York D-4, 11x9 & D-6, 12½x9, with 225 h.p. synchronous motor in center, 327 r.p.m. 2 ph. 60 cy. 220 V. Exciter & starting equip. Like new—Bargain for quick sale.

H. LOEB & SON
4643 Lancaster Ave. Philadelphia 31, Pa.

FOR SALE—Several sizes of ammonia and Freon compressors, ice plants, coils, brine coolers, condensers, receivers, oil traps, agitators, Diesel engines. Write us your requirements. Parke Pettegrew & Son Company, 370 West Broad St., Columbus 8, Ohio.

FOR SALE—Evaporator coil—50 ton new, built by Crane Co. Flooded type; immediate delivery. Write for description or photo and measurements; also compressors 2x2 to 8x8; valves, all types, cork insulation, board and granulated. Electrical Repair Co., 210 Prescott St., St. Paul 7, Minn.

FOR SALE—ICE PLANTS & EQUIPMENT

10, 15, 20, 30, 50 ton ice plants.
2—10x10 York ammonia compressors.
1—9x9 York ammonia compressor direct connected to a 75 h.p. synchronous motor.
1—9x9 York ammonia compressor 200 r.p.m.
1—8x8 York ammonia compressor 360 r.p.m.
1—7½x7½ York ammonia compressor with 40 h.p. 3/60/220 motor.
1—6½x6½ York ammonia compressor with capacity control valves.
1—6½x6½ York ammonia compressor 200 r.p.m.
1—5x5 Frick ammonia compressor 277 r.p.m.
1—4x4 York ammonia compressor 400 r.p.m.
1—4x4 York self-contained unit.
2—3x3 York self-contained units.
1000 ice cans, various sizes.
Motors and starters for all compressors.
Condensers, brine coolers, cranes, can dumps, can fillers, valves and fittings. Send us your requirements on any equipment that you may need.

B & E REFRIGERATING CO.
2 Orange St., Newark 2, N. J.
Phone MItchell 3-7790 Cable Address "BERECO"

FOR SALE—ICE PLANTS & EQUIPMENT

30-50-60-100 Ton Ice Plants—Immediate Sale
Ice Cans—11 x 22 x 47"—Good Condition
Ice Cans—11 x 22 x 51"—Excellent Condition
1—Frick 12 x 12" Ammonia Compressor direct connected to Deisel Engine—can be purchased without Diesel.
1—York 10 x 10" Ammonia Compressor direct connected to synchronous motor 3/60/440 Speed 300.
1—York 10 x 10" Ammonia Compressor direct connected to 60 H.P. synchronous motor 200 R.P.M.
1—York 10 x 10" Ammonia Compressor direct connected to 100 H.P. synchronous motor 200 R.P.M.
1—York 10 x 10" Ammonia Compressor 200 R.P.M.
1—York 10 x 10" Ammonia Compressor High Speed.
Parts for York 10 x 10" Cylinder Block, Top Heads, Pistons and connecting rod.
1—York 8 x 8" Ammonia Compressor direct connected to 60 H.P. synchronous motor 360 R.P.M.
1—York 8 x 8" Ammonia Compressor High Speed.
1—York 6 x 6" Ammonia Compressor High Speed.
1—Voss 6 x 6" Ammonia Compressor High Speed.
2—Frick 3 x 3" H.S. Self contained units.
Can supply motors for all compressors.
Low pressure blowers—all sizes.
Assorted sizes electric hoists and cranes ranging from 2 to 4 ton capacity.
2—Gifford & Wood Tiering Machines, 5-tiers.
1—Scoring Machine Perfection.
2—Sheppard Cranes 4 and 5 ton capacities—3 motor jobs.
Brine coolers, submerged shell and tube type. 1¼" and 2" Ammonia Coils, approximately 10,000 feet.

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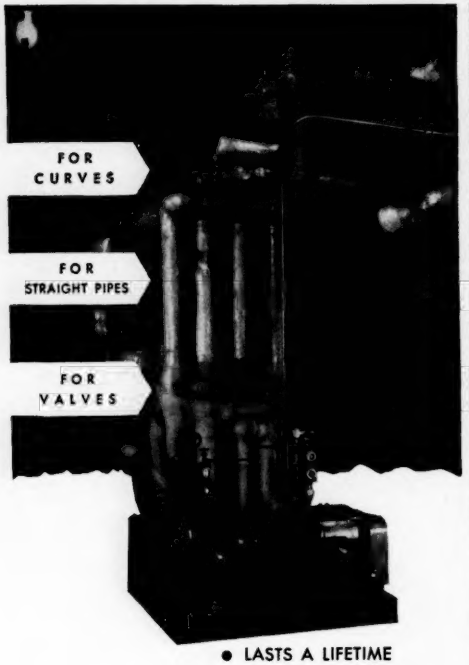

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Dept. L110, Merchandise Mart
Chicago 54, Illinois

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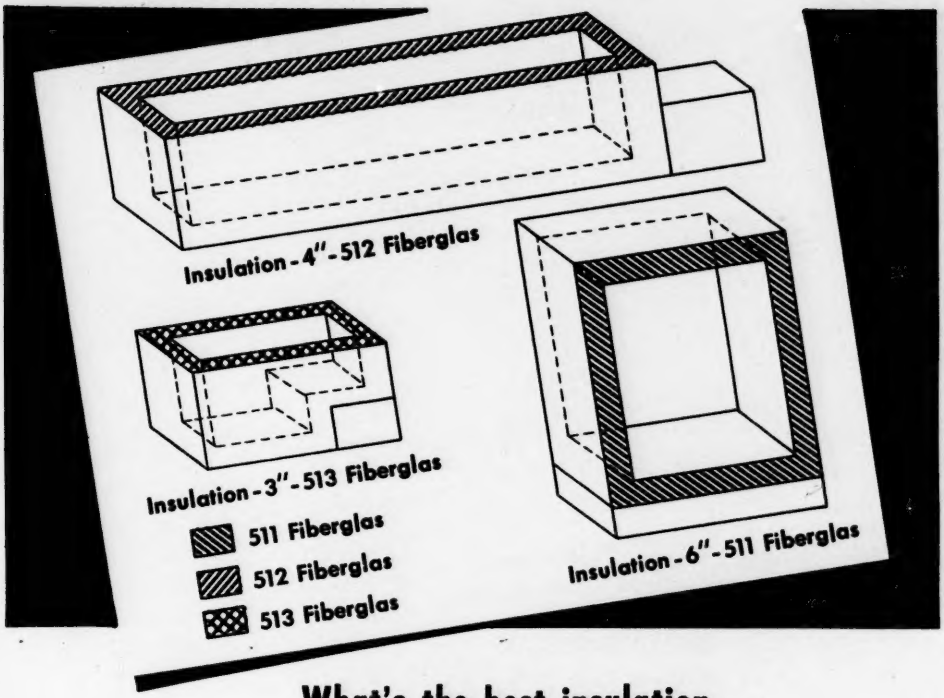
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What's the best insulation for a home freezer?

Today, home freezers are being built with insulation thicknesses ranging from 3 to 6 inches. Many manufacturers are insulating these units with materials from the 500 Fiberglas* series, PF-511, 512, or 513.

One of the main reasons for the popularity of these insulations lies in their carefully controlled conductivities. This allows a manufacturer to design equipment with minimum insulation thickness, yet with assurance that the insulation will provide sufficient heat resistance to prevent condensation on the outer shell and permit efficient operation.

It would be impractical to recommend any one type or thickness of 500 Series Fiberglas as a standard for all home freezers. The design of each unit will dictate both type and thickness. However, it is sometimes possible for a manufacturer who is using one type and thickness to increase interior capacity without changing exterior dimensions merely by switching to less thickness of another type.

Selecting the right Fiberglas for your model, and determining which thickness will do the best job, is often a difficult task. Armstrong engineers are well acquainted with the performance standards of the various types of Fiberglas. Their wide experience with these insulating materials and their understanding of equipment design enable them to offer you sound advice on the design and construction of your unit. They also recommend insulations for other equipment which you may be making. The Armstrong Line is complete—including LK® Corkboard, Temlok® fiberboard insulation, and Fiberglas. Armstrong will be glad to test your equipment, built with the materials recommended, in the Armstrong Life Test Room. A few weeks in this room are equal to years of actual use. The service is free.

For details, call the Armstrong office nearest you or write to Armstrong Cork Company, 4510 Queen Street, Lancaster, Penna.

*Ⓡ OCF Corp.

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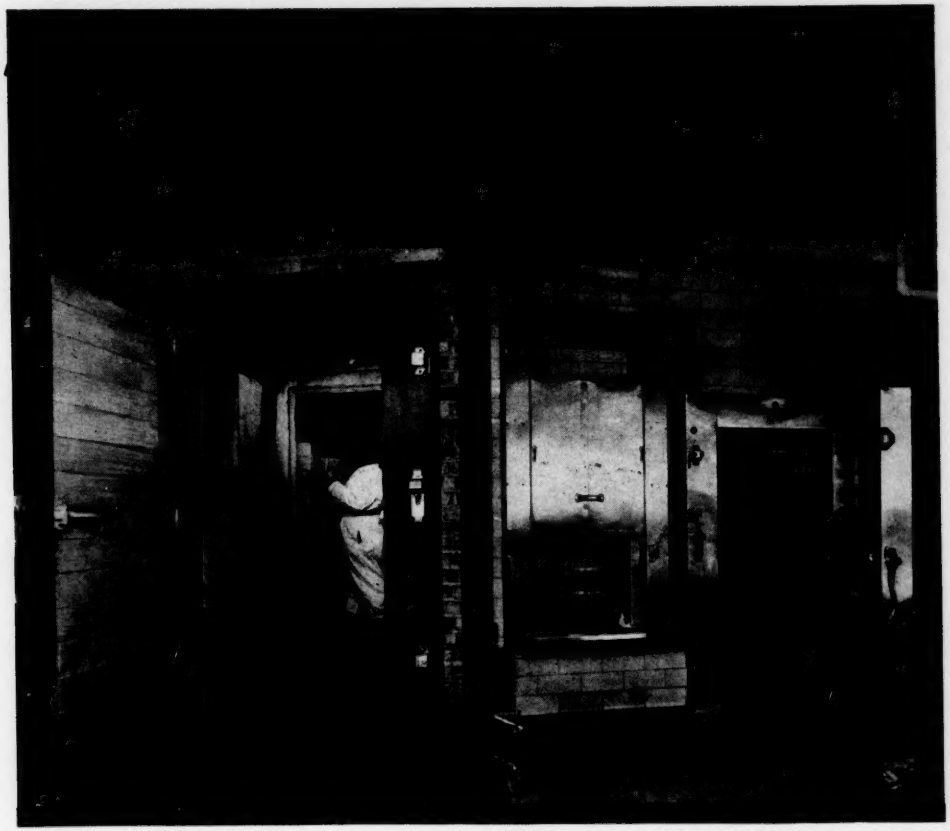

OUTSIDE... Sturdy Metal-Clad Door

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INSIDE... Sanitary Stainless Steel Clad Doors

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